ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43145662 **GROUP:** 16
Version A

70

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
B — b. Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

A — **2.** Which of the following would be considered a negative feedback to increasing global temperature?
Less ice = more energy absorbed
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere — more melting
→ c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere
Less ice → increased temp = Neg. more clouds one ↓ one ↑

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
C — b. A = erosion, B= biochemical precipitation, C= uplift and deposition
c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
B — b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
B — a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
B — b. Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

A B

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

$\frac{\text{input}}{\text{output}} = \frac{1000}{100} = 10$

D

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. ~~Reflection of more solar radiation, causing atmospheric temperature to increase~~
   c. ~~Re-emitting of more infrared radiation, causing atmospheric temperature to increase~~
   d. ~~Re-emitting of more infrared radiation, causing atmospheric temperature to decrease~~

A

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. ~~Less energy~~ will be released during cloud formation, and therefore Earth's atmospheric ~~temperature~~ will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. ~~Less energy~~ will be released during cloud formation, and therefore Earth's atmospheric ~~temperature~~ will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

B

10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
    a. The Earth's atmosphere would become colder than it is today.
    b. The Earth's atmosphere would become warmer than it is today.
    c. The Earth's atmosphere would remain about the same temperature as it is today.
    d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

C

some industrial countries are decreasing outputs, some developing countries are increasing outputs

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$
b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

The process by which oceans experience a change in pH causing acidification is as a result of increased CO_2 in the atmosphere. CO_2 in the atmosphere enters the hydrosphere through dissolution and further interacts w/ hydrogen forming ions which cause a decrease in pH in the ocean water. Increase CO_2 also increase atmos. which leads to warmer water and greater ~~X~~ evaporation

negative feedback: CO_2 in hydrosphere leads to decrease pH in oceans

positive feedback: CO_2 increase in atmosphere leads to CO_2 increase in hydrosphere

20

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Increased volcanism would result in ash in the atmosphere which would block incoming solar radiation from the sun.

Greenhouse effect: Incoming solar radiation (mostly short wave visible light and some UV and IR) is absorbed by the earths surface, transformed and re ~~reradiated~~ into atmosphere. GHG's such as CO_2, methane, and water vapor absorb the longwave radiation and again reradiate back to earth. Thus allows our planet to maintain warmer habitable temperature.

Particles in the atmosphere such as clouds and volcanic ash prevent the radiation from reaching the earth to perform this process, which would cause measurable cooling.

20

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Evaporation = process by which H_2O enters the atmosphere (ocean → atmosphere)

Degassing = process by which CO_2 enters the

Earn up to 1 additional point on your course grade

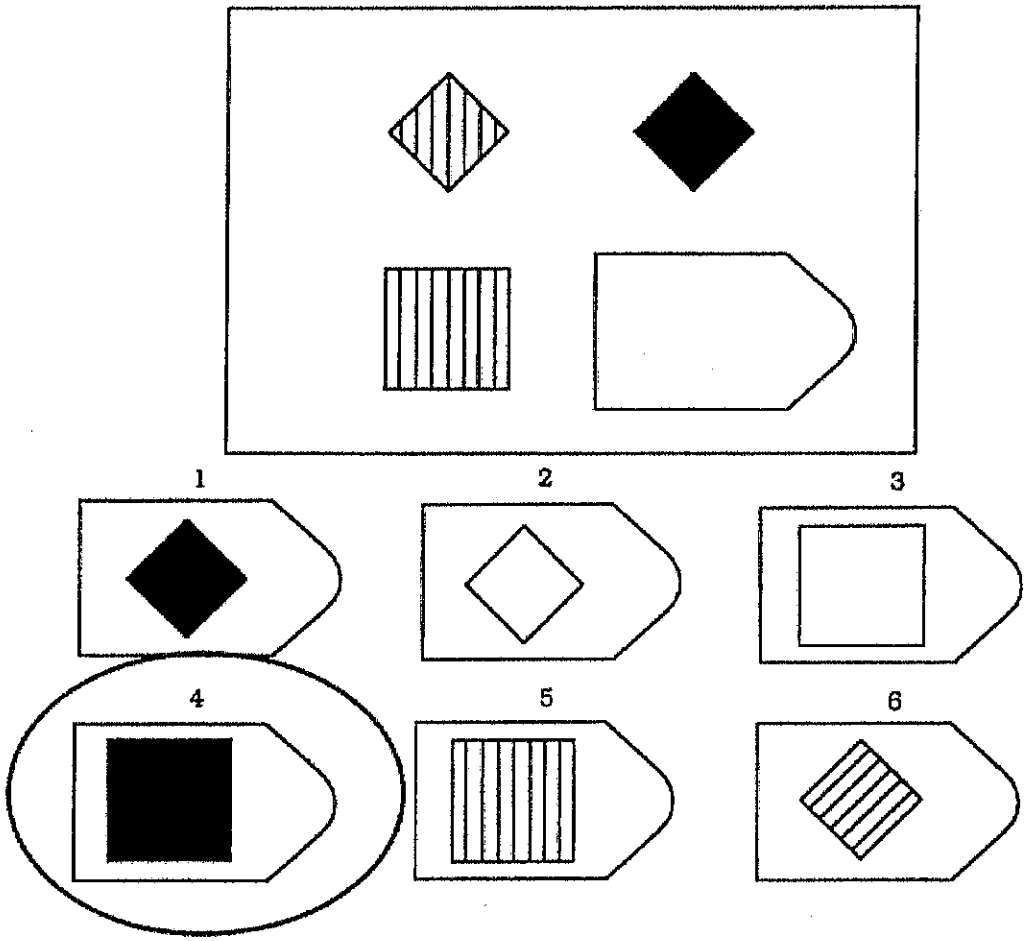
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form A Test 1 Student ID 4314516162

Please choose the image that best completes each of the following patterns.

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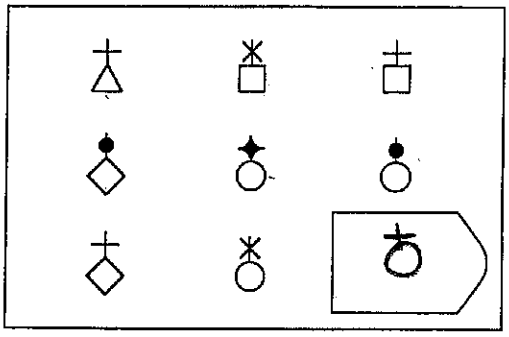

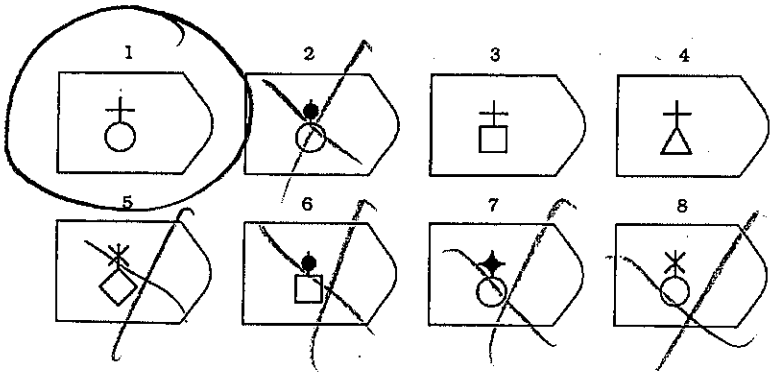

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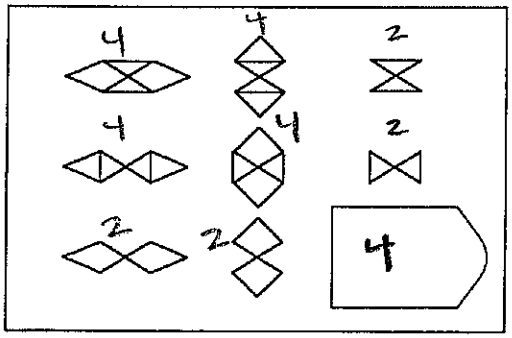

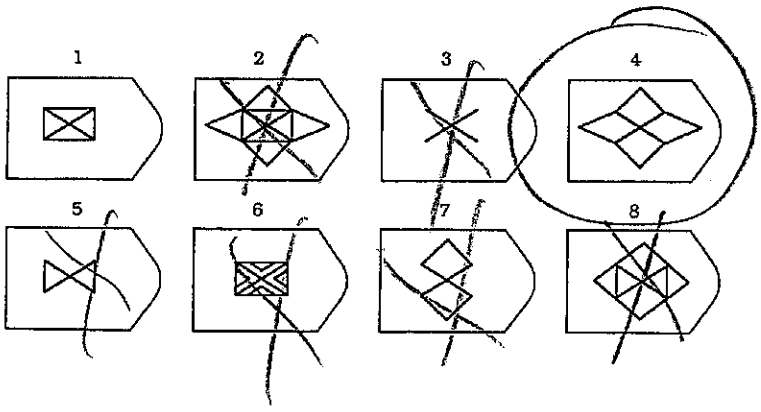

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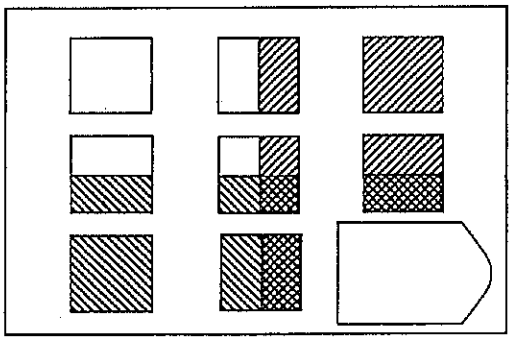

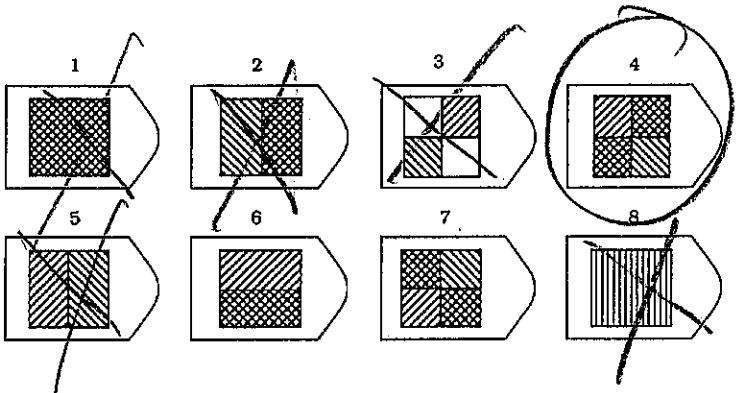

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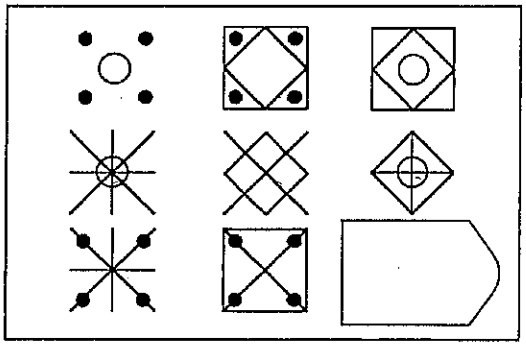

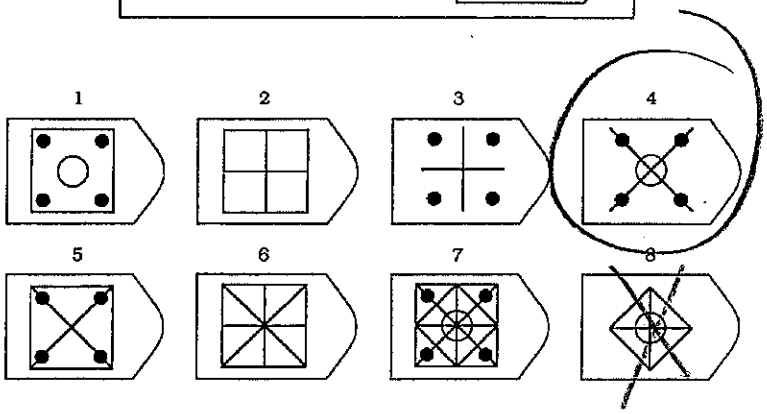

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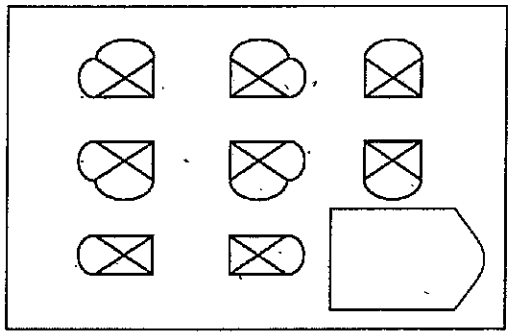
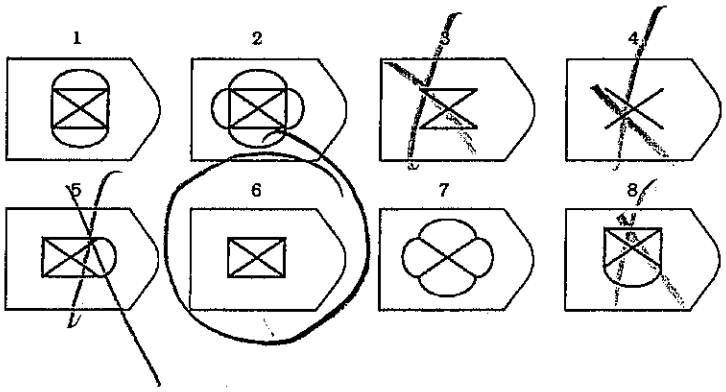
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet. ← Then she was doing it wrong.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. ~~The plumber fixed~~ the pump that had burst and flooded the basement.

B. ~~Steven avoided~~ midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

(D) The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

(A) An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

(A) Getting the flu. They are similar because they are both caused by viruses.

B. ~~Getting pink eye.~~ They are similar because they are both contagious.

C. ~~Getting the flu.~~ They are similar because they are both caused by not washing your hands.

D. ~~Forgetting to do your homework.~~ They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 24 **years**

What is your home zip code? 48933

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A37497963 **GROUP:** 16
Version A

37

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
B. (b.) Gas bubbles forming in the magma
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2. Which of the following would be considered a negative feedback to increasing global temperature?
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3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

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4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
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   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
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10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
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A37497963

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

If there was an increase in atmospheric carbon dioxide, the ocean temperature would increase. When the ocean temperature is increased there is less ocean acidification. This would be a negative feedback loop because the increase in atmospheric carbon dioxide would cause a decrease in ocean acidification.

5

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

If there was an increase in volcanoes that erupt large ash clouds, there would be an increase of ash in the atmosphere, which would not let in as much sunlight into the atmosphere. This decrease in infared light coming in would mean there is less light to be reflected off the surface and into absorbed into the atmosphere meaning the overall temperature would decrease.

5

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

2

Evaporation is liquid changing to gas, and degassing is gas entering the air.

A 37497963

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

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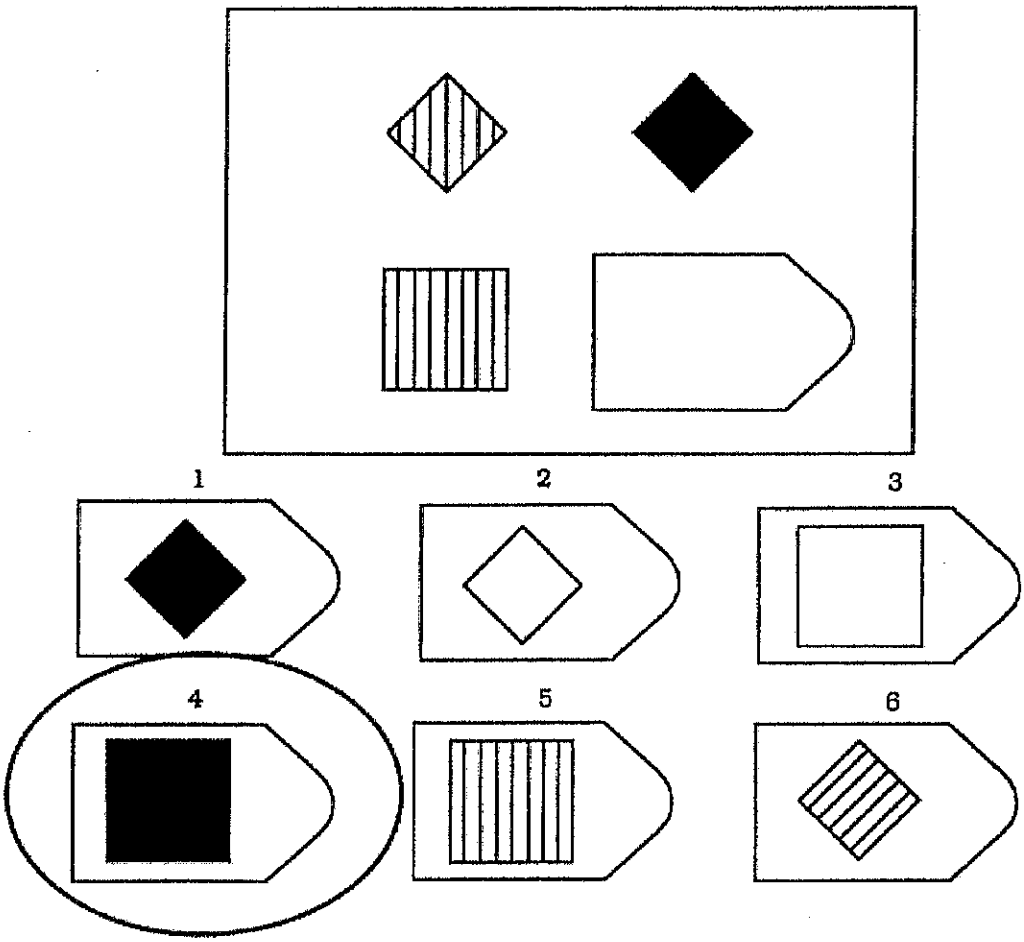

Answer: 4

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Form A Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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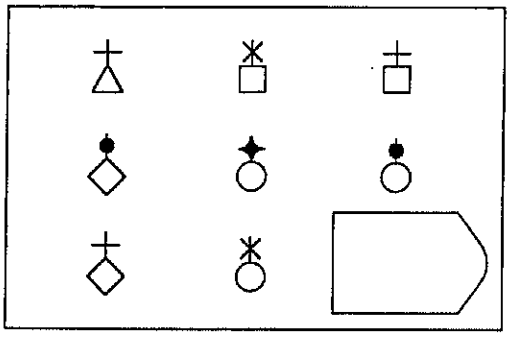
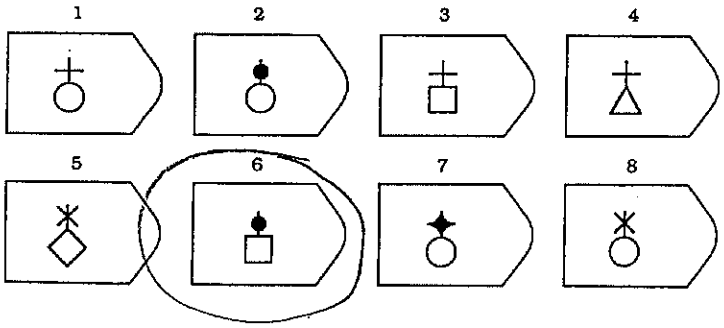
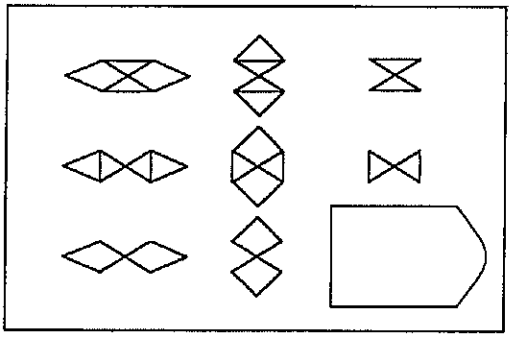
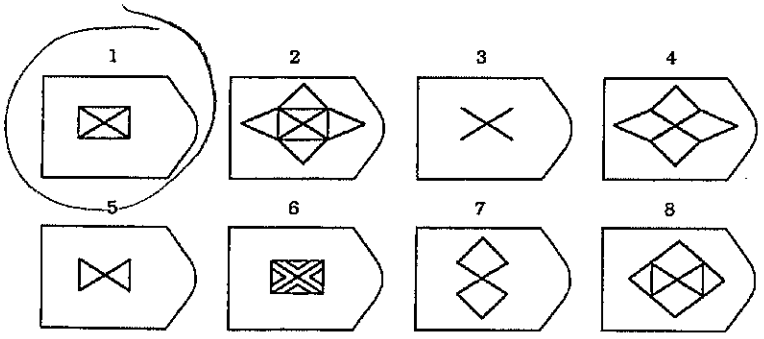




PATTERN 2





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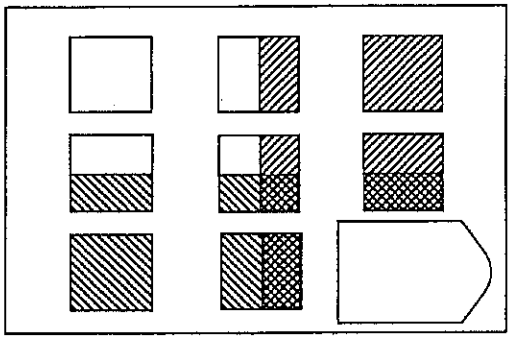

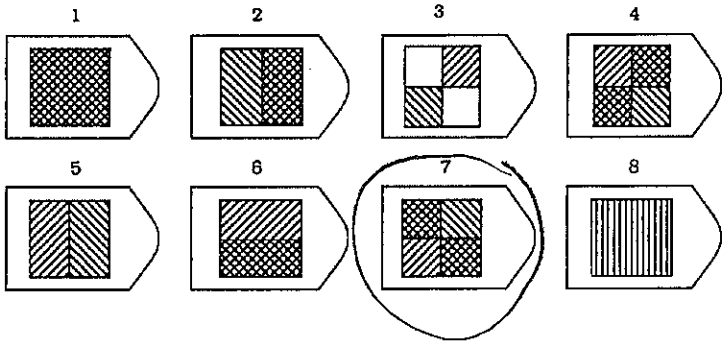

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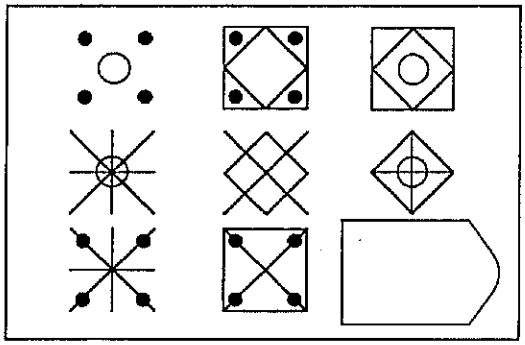

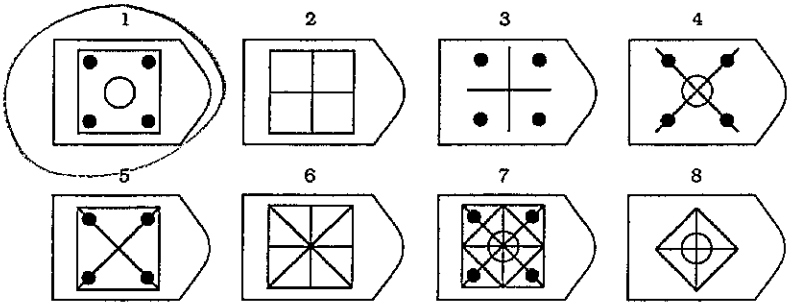

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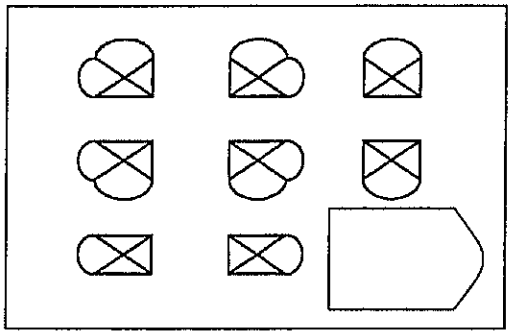

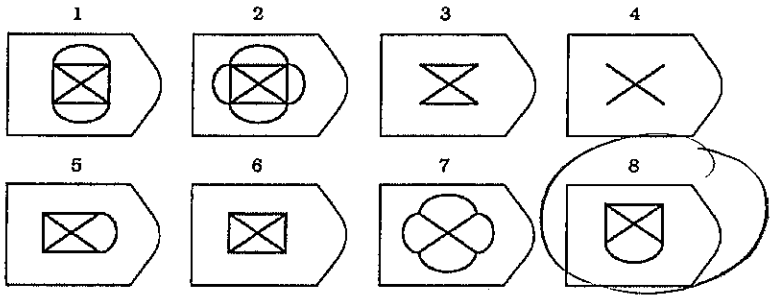

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Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 23 **years**

What is your home zip code? 48708

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41944159 **GROUP:** 16
Version A

76

MULTIPLE-CHOICE. 5 points each (50 points total).

E

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder (density ↓)
   (b) Gas bubbles forming in the magma (erupt)
   c. The surrounding crust becoming hotter (rises)
   d. Crystals forming in the magma

C

2. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   (c.) An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

C

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   (c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

C

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   (c.) Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

A

5. Which of the following would cause the acidity of Earth's oceans to decrease?
   (a) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   (b.) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

influx & outflow are equal to each other

Res A has the same influx as Res B &

(B) **7.** A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
a. The reservoir will eventually disappear.
(b.) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

(A) **8.** Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation? albedo effect
(a) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

(B) **9.** Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
(b) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

(D) **10.** What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
(d.) The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

A41944159

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

↑ ocean acidification

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$ CO2 would increase causing a higher pH

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

- If there was an increase in atmospheric carbon dioxide there would also be an increase ocean carbon dioxide levels. This increase in carbon dioxide would cause an increase of the pH of the ocean which would show increased ocean Acidification. ✓

- Positive feedback: The more CO_2 there is in the atmosphere the more CO_2 there will be in the oceans. As a result of increased ocean acitification even more CO_2 would be released into the atmosphere and the cycle would continue.

- Negitive feedback: This is what keeps the system at equilibrium. The increase in ocean acidity would cause an increase in ocean temperature. Warmer temperatures can support and counteract the added CO_2?

21

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

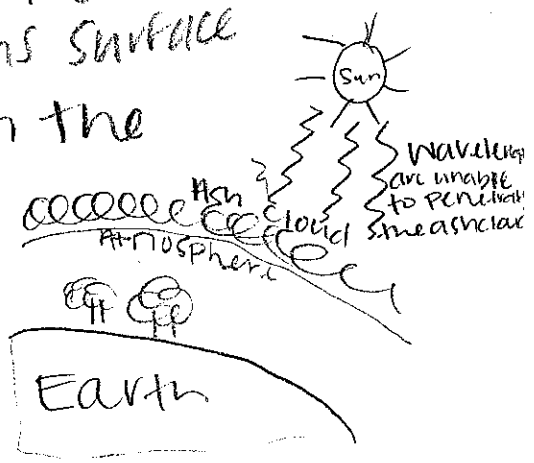
Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

An increase of volcanism on earth with volcanoes that erupt large ash clouds would increase the amount of ash in the atmosphere. This increase in ash would block incoming solar radiation. This lack of perviable radiation would have a large impact on the greenhouse effect. With visible light from the sun unable to penetrate the ash clouds the light will be unable to be absorbed by the earths surfaces. Because there is no visible light being absorbed more is no infared light being emitted This infared light is what heats the atmosphere and when it isn't there to be reemitted back to earths surface there will be a decrease in the atmospheric temperature.

exp!.

20



Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Evaporation and degassing are similar because they are both becoming a vapor. However, they are different because evaporation goes from a liquid to a vapor.

Earn up to 1 additional point on your course grade

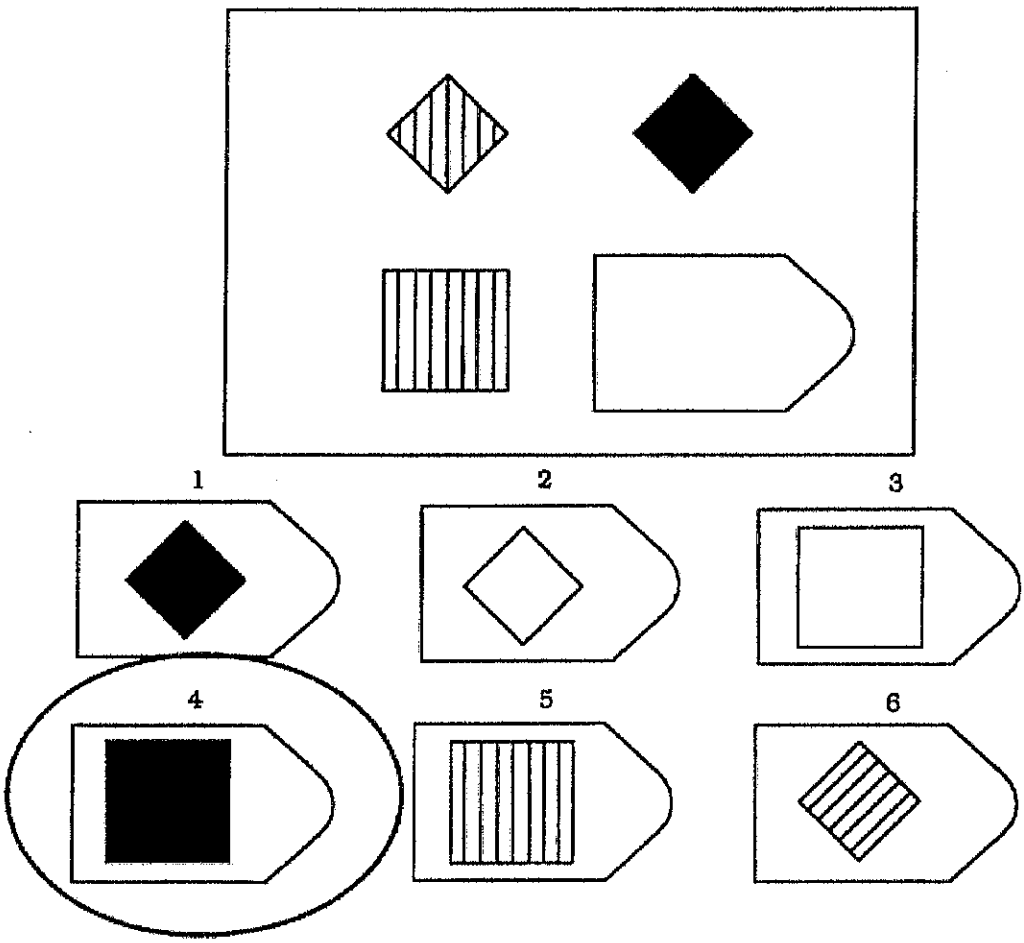
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



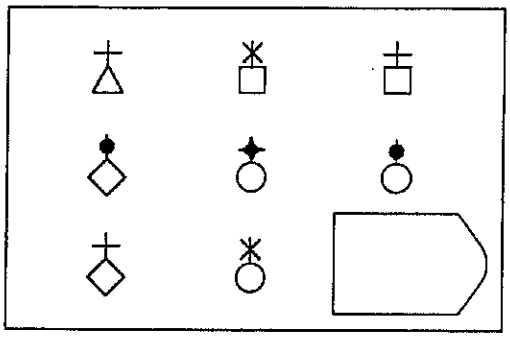
Answer: 4

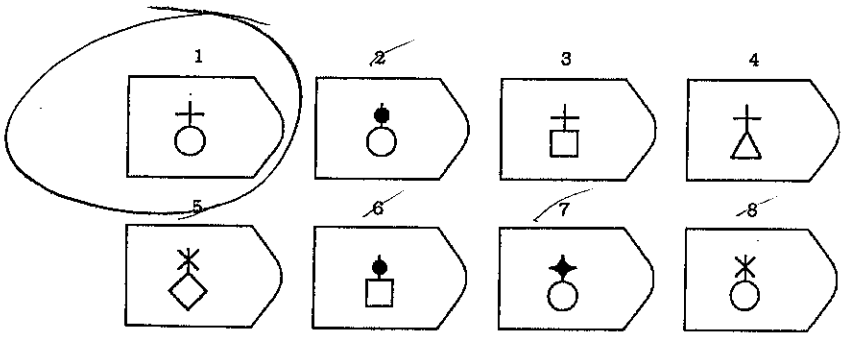
PLEASE CONTINUE ON NEXT PAGE

Form A Test 1 Student ID _____

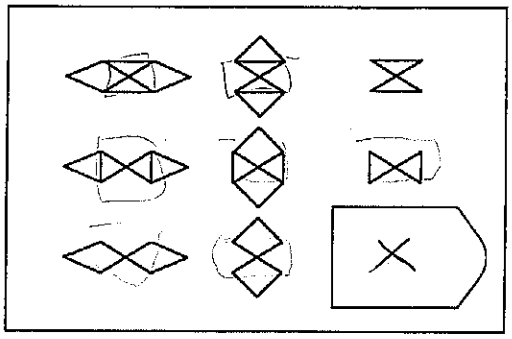
Please choose the image that best completes each of the following patterns.

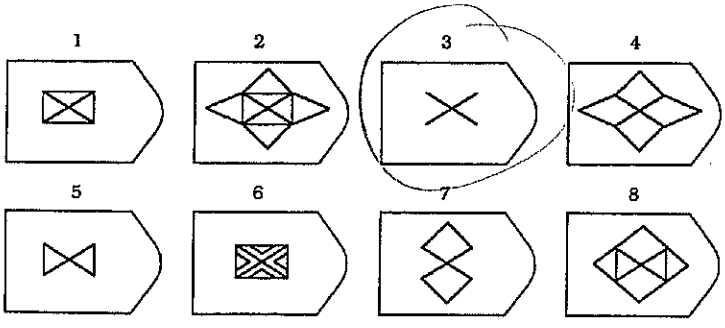
PATTERN 1





PATTERN 2





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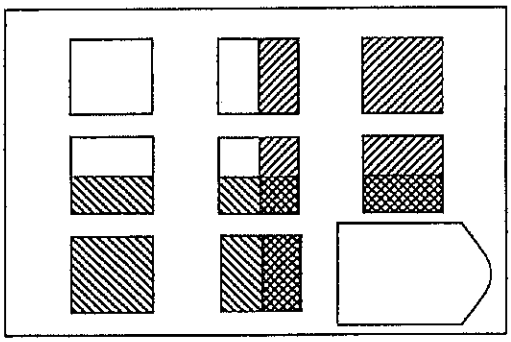
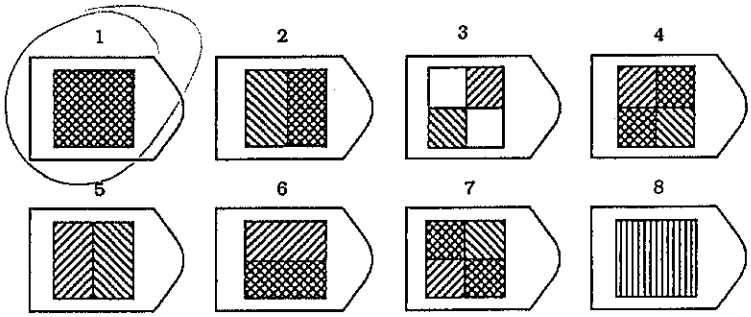
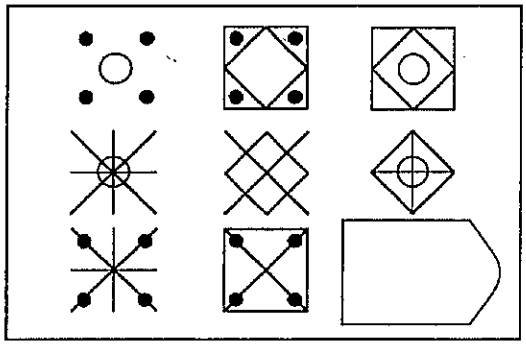
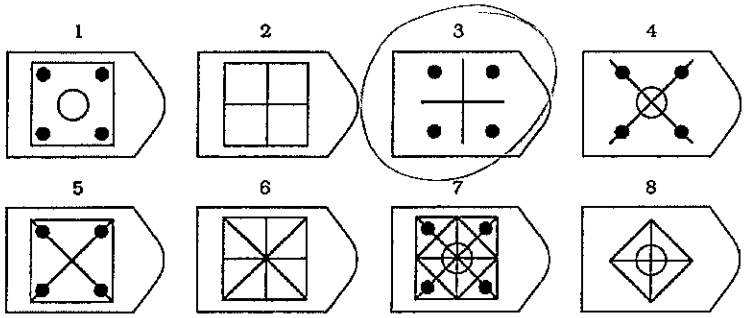
PATTERN 3





PATTERN 4





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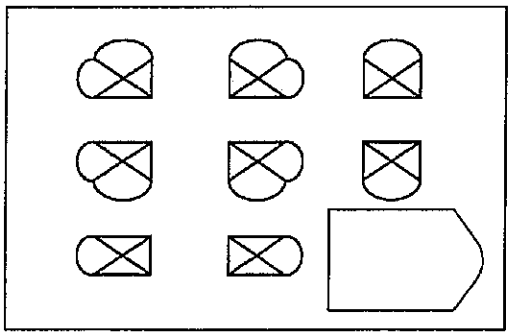
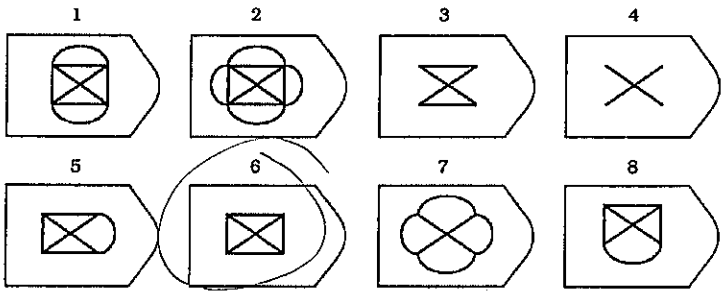
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 49684

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41727610 **GROUP:** 春 17 62

Version B

* I was at your office hours before the exam (I was wearing the Ireland shirt)

MULTIPLE-CHOICE. 5 points each (50 points total).

C 1. Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

B 2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
b. Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

D 3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of ____C____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

A 4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

B 5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
b. Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

A B

C 6. Which of the following would cause the acidity of Earth's oceans to decrease?
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

$\tau = \frac{\Sigma}{F}$

$\tau = \frac{1000}{50} = 20$

A

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

B

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

C

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

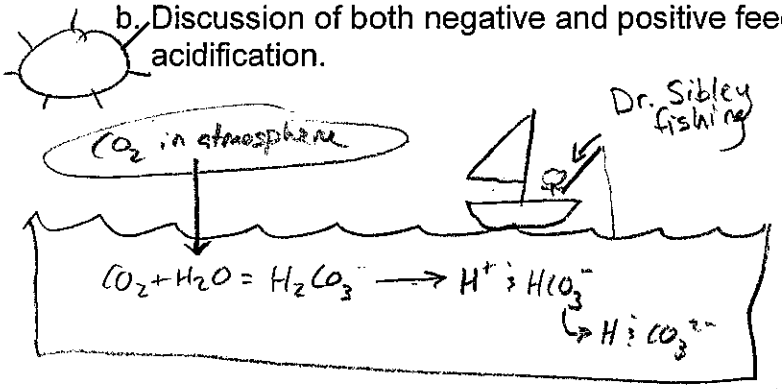
SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.



Ocean acidification is the process that lowers the pH level of the oceans by introducing carbon dioxide to the water. Carbon dioxide from the atmosphere enters the water and combines with the water molecules. From there the molecules slowly break down, releasing H^+ ions into the water. The amount of carbonic acid, or HCO_3^-, in the water determines the acidity. With more carbon dioxide in the atmosphere, the ocean (or hydrosphere) will attempt to reach equilibrium within the carbon cycle by bringing in more CO_2 from the atmosphere. The more CO_2 in the water leads to more HCO_3^- forming, so the water would become more acidic (pH ↓) ✓

20

Positive Feedback

More Carbon dioxide in atmosphere → more carbon dioxide going into ocean → carbon going into marine life's skeletons → formation of sedimentary rock (deposition) → fuels into coal over time → burned for energy → More Carbon dioxide in atmosphere

Negative Feedback

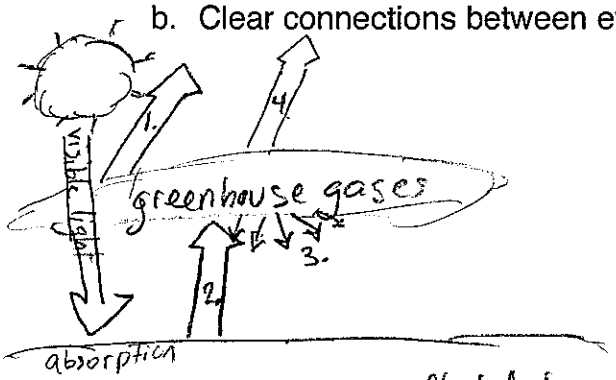
more CO_2 in atmosphere → more CO_2 in ocean. → Greenhouse effect heats earth (CO_2 is a greenhouse gas) → more CO_2 in ocean than atmosphere → ocean acidification process

A41727610 (17)

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

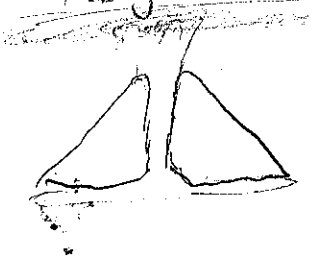
a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.



The greenhouse effect begins when the Sun radiates visible light energy on to the Earth. The Earth's surface absorbs the energy and re-emits it in the form of IR light. (2) The greenhouse gases in the atmosphere then absorb the IR light and reradiate it back to the Earth in all directions. (3.)

1.) Some visible light is reflected by the greenhouse gases initially

(4.) Some light does make it to the atmosphere through the greenhouse gases.



When gases around magma enter the magma, the density of magma decreases. Because the density of magma < density of earth's crust, the magma begins to rise and flow out of the volcano. Ash is ejected from the volcano and forms a cloud in the atmosphere, blocking the Sun's light. Carbon dioxide is also emitted when the gases leave the magma and go into the atmosphere

With the ash cloud blocking the Sun's light from reaching Earth, the temperature would go down. However, when the ash disappears, the extra greenhouse gases from the volcanism would trap the now radiating thermal energy, raising the temperature.

25

2 Extra credit (2 points).

How are evaporation and degassing similar and/or different?

Evaporation is liquid becoming a gas. Degassing is gas inside a liquid leaving and going into the atmosphere

Earn up to 1 additional point on your course grade

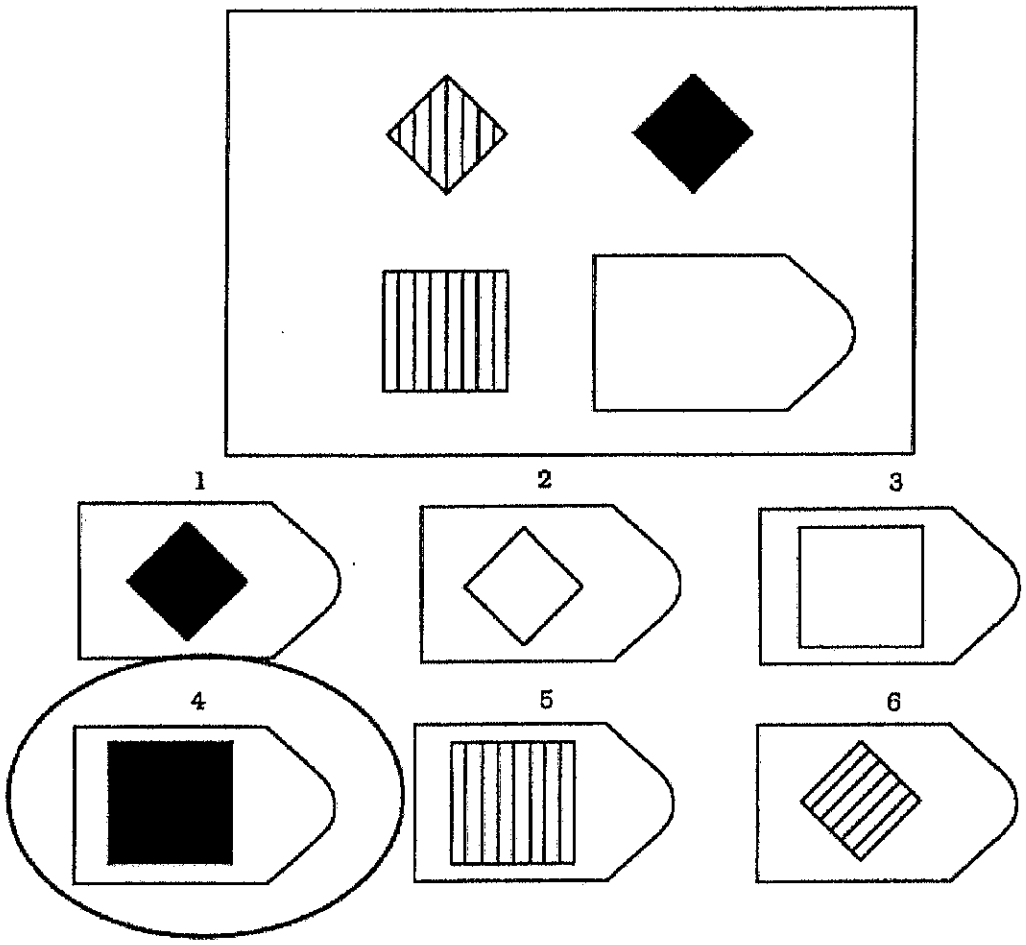
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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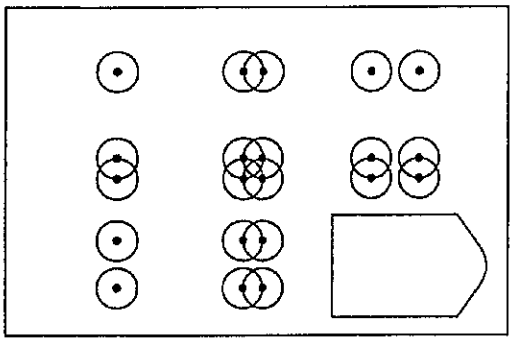
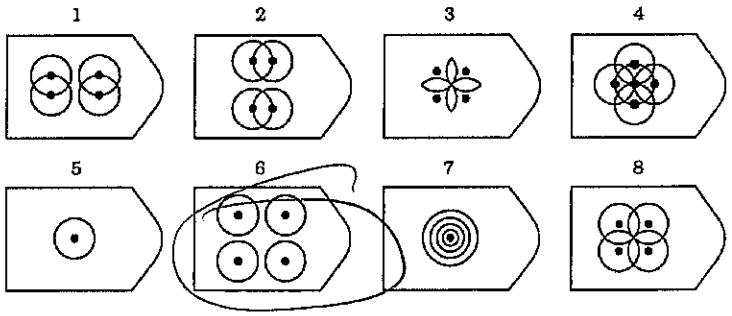
Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

PATTERN 1





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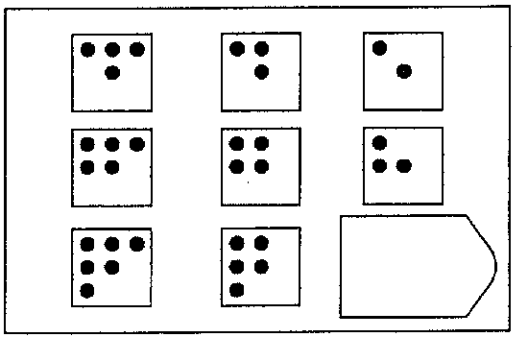

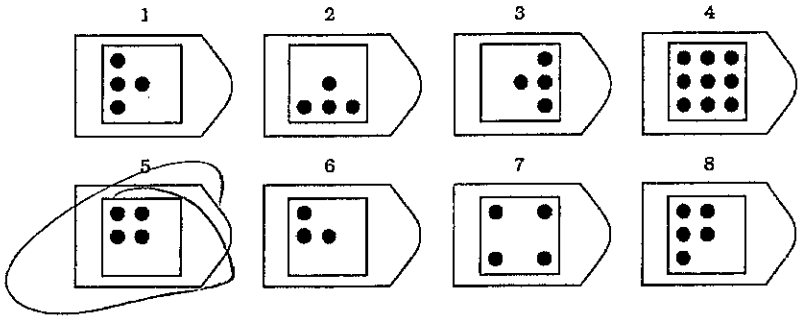

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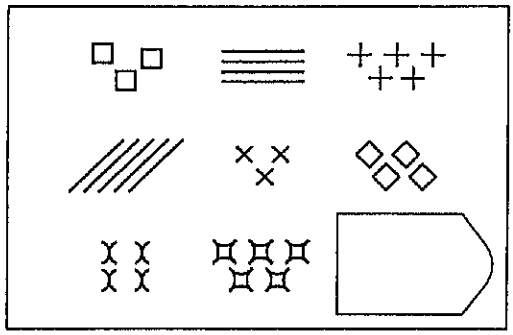
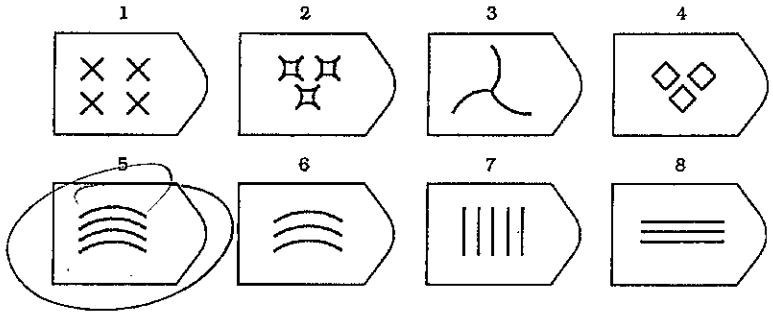
PATTERN 3





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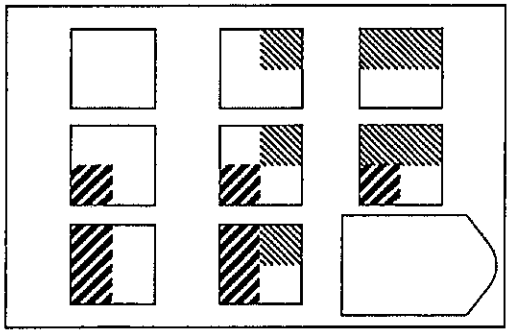
PATTERN 4



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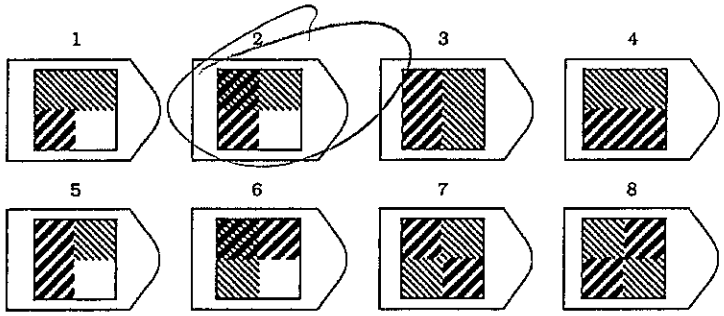

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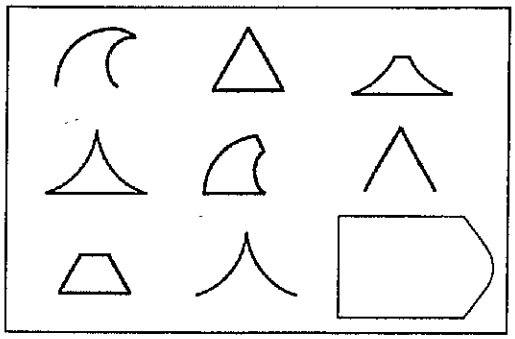
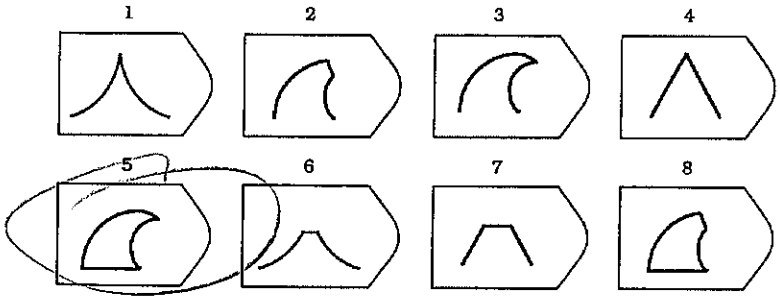
PATTERN 5





5

In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

A 5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

A 1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

C 2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 19 **years**

What is your home zip code? 48310

What is your gender?

✓ Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
✓ Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

62

I was at the office hours before the exam

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42503261 **GROUP:** 17
Version B

Exam 2 Grade 51 n/t 47

MULTIPLE-CHOICE. 5 points each (50 points total).

B 1. Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
(b.) Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

B 2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
(b.) Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

C 3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
(c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

B 4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
(b.) Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

B 5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
(b.) Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

C 6. Which of the following would cause the acidity of Earth's oceans to decrease?
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
(c.) A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

A42503261

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   (b.) The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

B

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   (a.) The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

In general CO_2 levels are rising as time goes on

A

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   (d.) Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

D

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   (b.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

B

A42503261

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

a. Ocean acidification occurs when CO_2 enters the water. When the CO_2 is added to the water (H_2O), the water produces more Acid (H^+). There are many different occurances that could cause the ocean to increase its acidity. The ocean goes through the process of acidification because the atmosphere and the water must maintain a CO_2 equilibrium

CO_2 ↓

$H_2O \longleftrightarrow HCO_3^- + \boxed{H^+}$ ← Acid increase

To decrease the acidity of the water the ocean must remove the CO_2 gas. The process of removing this gas is called degassing

b. The ocean experiences a positive feedback because the CO_2 gas causes more of the acid to be produced to maintain equilibrium. The negative feedback would be that there is less CO_2 in the atmosphere so temperature would decrease?

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A42503261

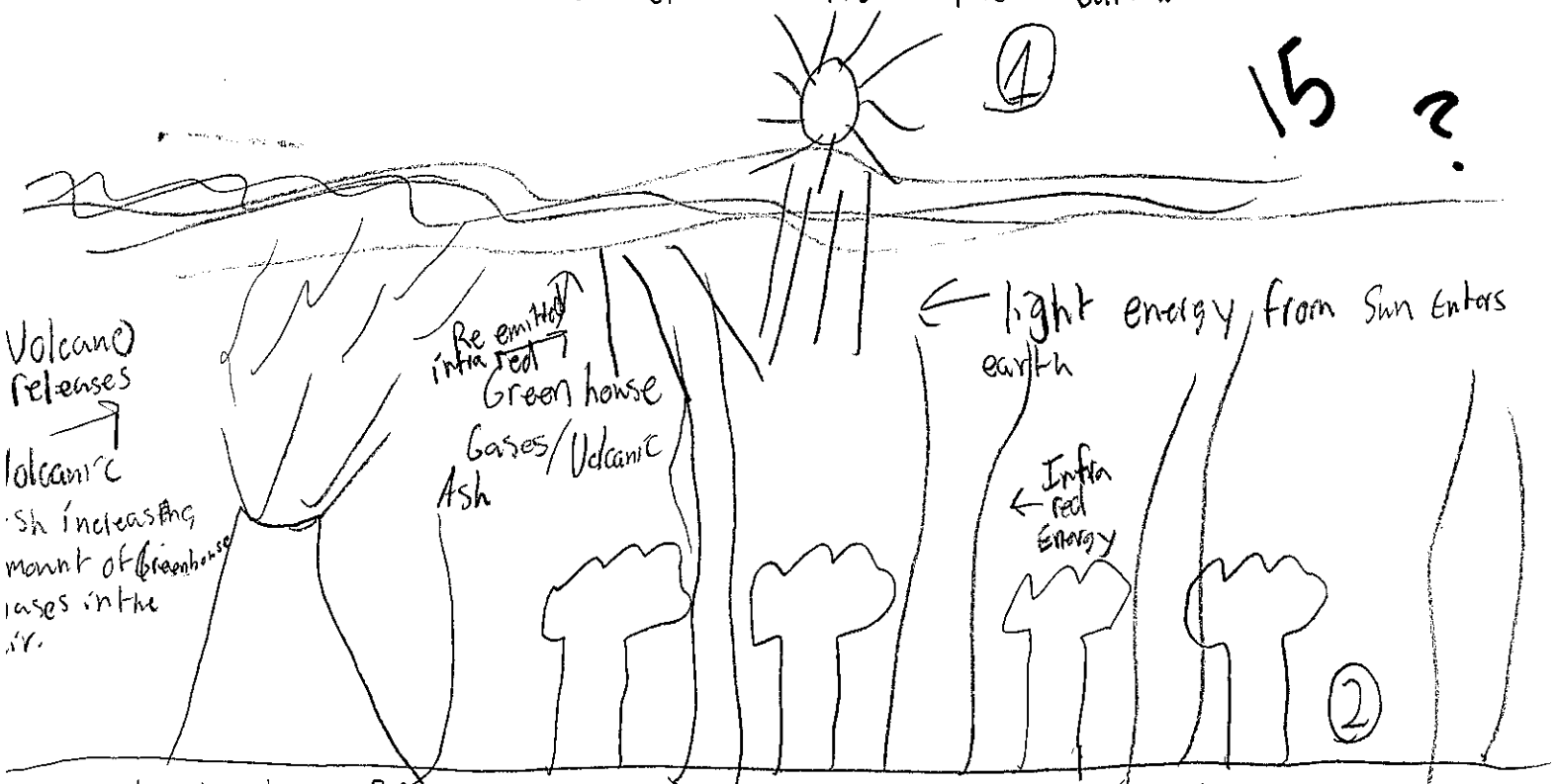
2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Continued on next page

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

a. When water rushes into a volcano this causes the magma to rise. While the magma is rising the magma is bubbling These bubbles are produces by the magma degasing CO_2 from its Compositron. This CO_2 along with other gas compounds produce the ash clouds that are emitted from the earth.



Absorbs the infra red energy and readmits it back towards earths surface. Soil and plants - Soil absorbs Light energy, converts to thermal energy. Energy is readmitted as infra red energy.

Extra credit (2 points).

How are evaporation and degassing similar and/or different?

Evaporation is the changing of state from liquid to gas while degassing is the removal of gas from a liquid.

A42503261

6. The increase in Volcanic ash would have many potential effects on earth's temperature. Potentially the ash would cause less light energy from the sun to be emitted to earth. This would cause a decrease in temperature. However an increase in CO_2 and other greenhouse gases would cause the temperature to rise because more infrared energy would be absorbed and re-emitted back to earth surface by the greenhouse gases.

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

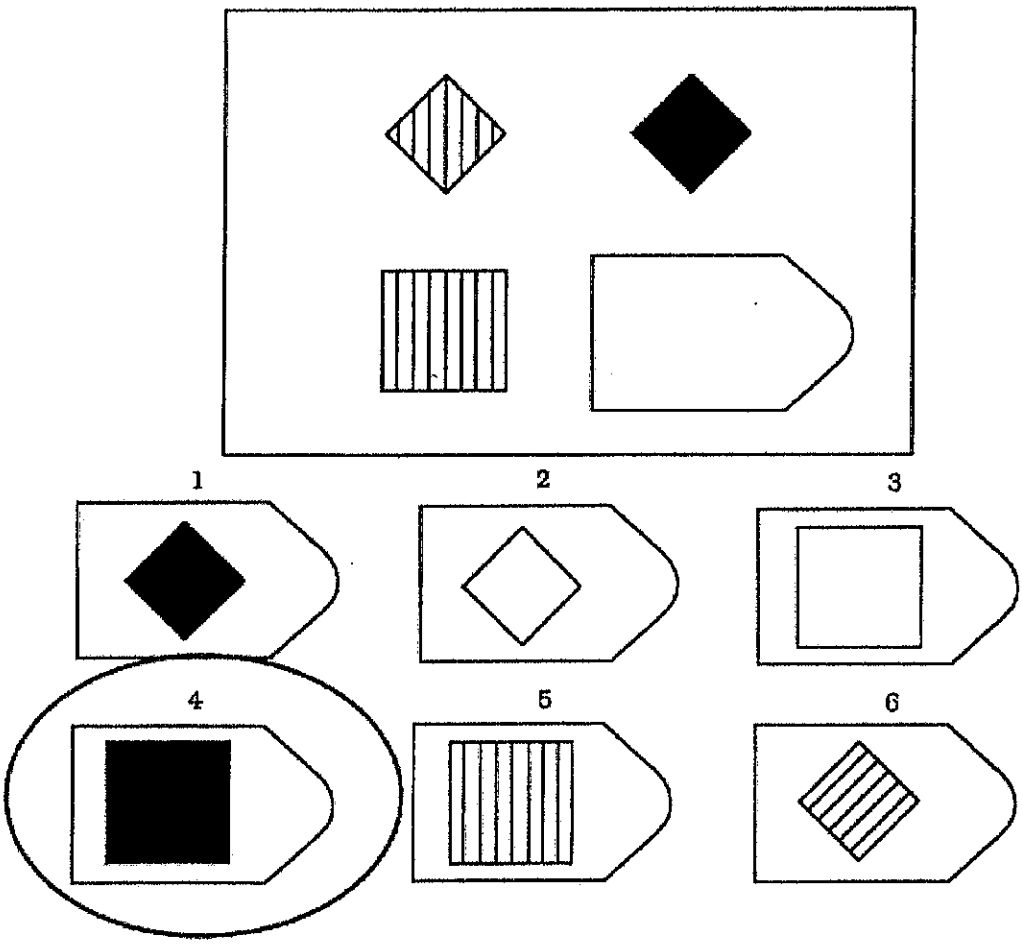
Thoughtfully complete the attached survey

Form B Test 1 Student ID A42503261

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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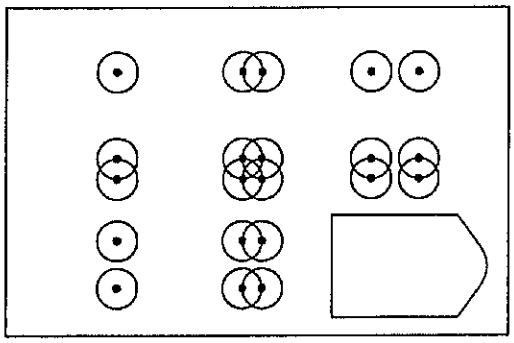
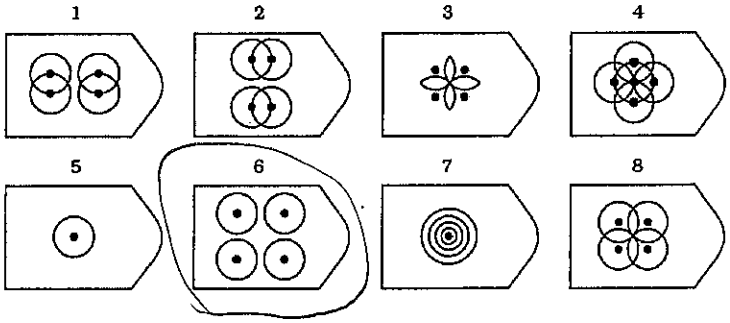
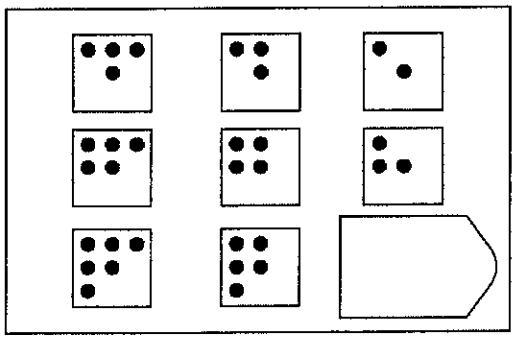
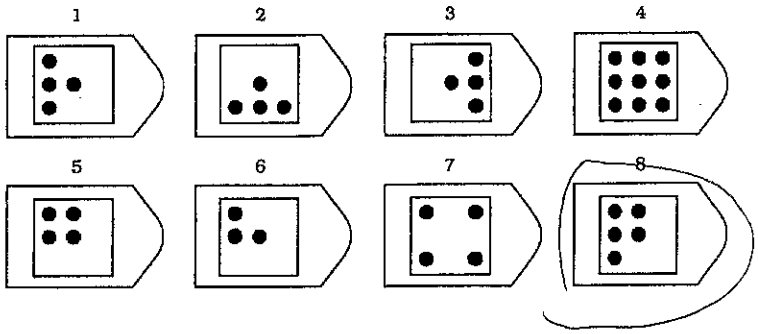
PATTERN 1





PATTERN 2





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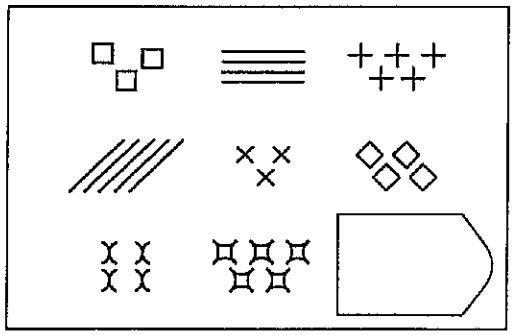
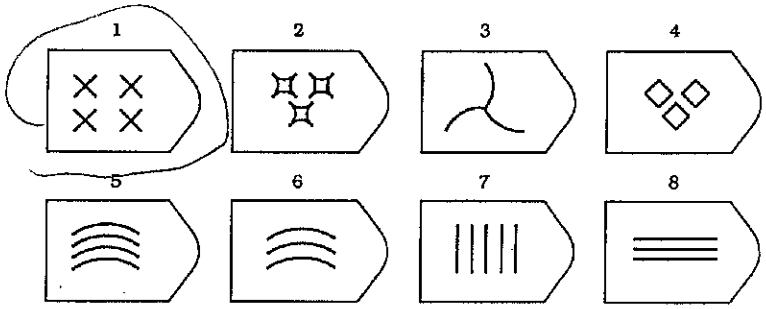
PATTERN 3





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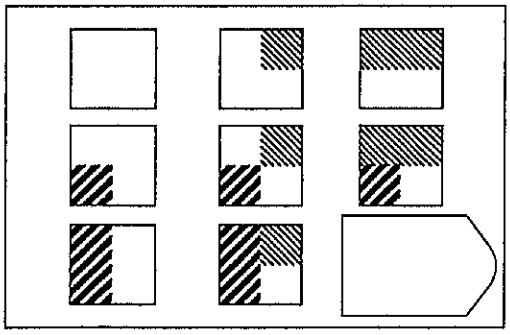

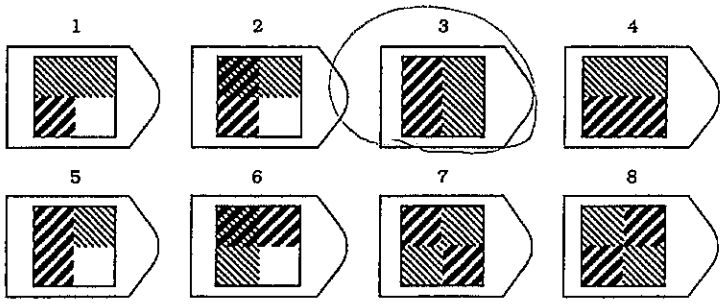

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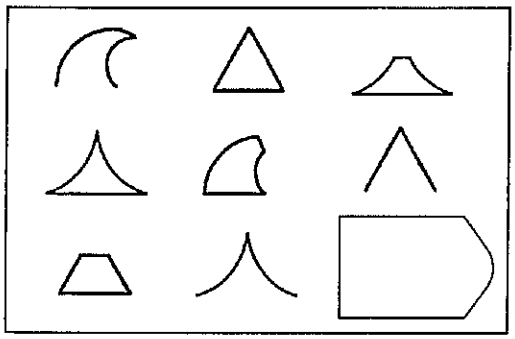
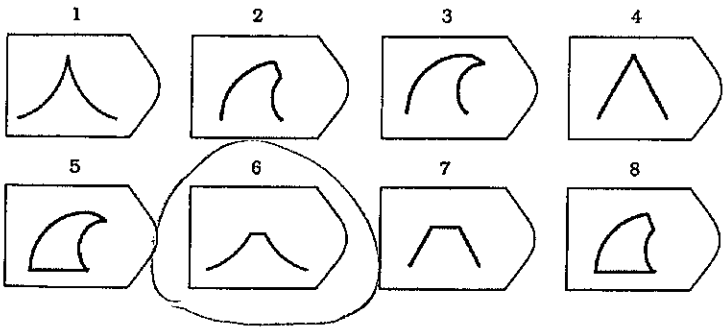
PATTERN 5





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PLEASE CONTINUE ON NEXT PAGE

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D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

(A) Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

(D) Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

(C) Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

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DEMOGRAPHICS

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What is your gender?

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___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

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X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43436466 **GROUP:** 18
Version A

81

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

2. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
a. The reservoir will eventually disappear.
(b.) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
(a.) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
(b.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
(a.) The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

SHORT ANSWER. 25 points each (50 points total)

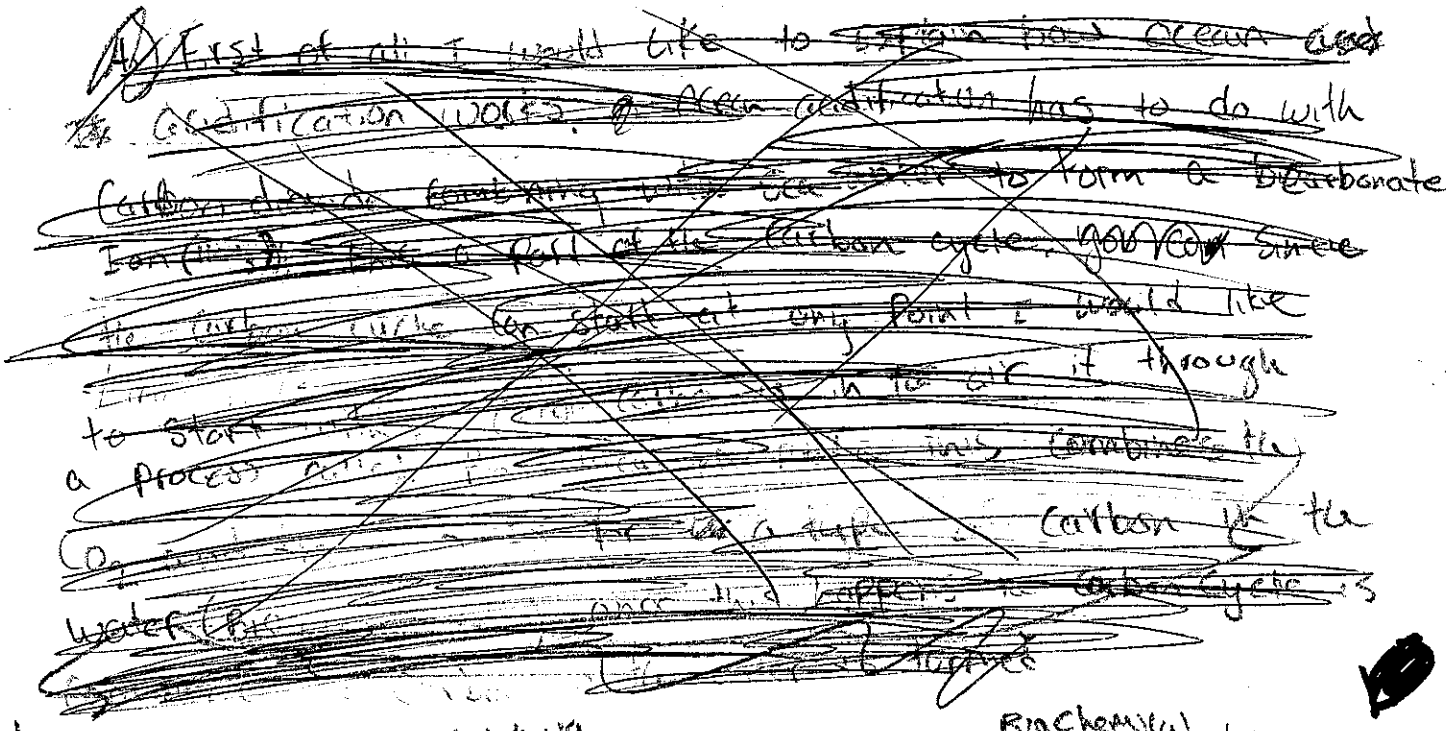
1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

See next Page aswell as what is on the bottom



A) Limestone ($CaCO_3$) —Weathering→ Bicarbonate Ion —Biochemical Precipitation→ CO_2 in Sea water —Degassing→ CO_2 in the air —Oxidation→ Organic Compounds —Death/Transportation→ The carbon becomes part of the earth then compounded into Limestone again where this process starts over. From above it is easy to see where positive feedback could happen. More carbon added to the atmosphere just causes form more carbon to go through the cycle which would eventually be too much for plants to respire with. Since plants can not keep up with this added amount of carbon the carbon will just continue to go through this cycle at an accelerated rate.

20

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

A.) The greenhouse Effect is a tricky Process that Involves ~~the~~ Many⁺ different Parts of the Earth along with the Sun. The greenhouse Effect Starts by the Radiation of the Sun. The Suns Radiation gives off visible light, Light that is purely radiation. once that Radiation Gets into the earth atmosphere, it will do one of 2 thing. One It will get reflected off the earth's surface back into outerspace. Or 2, it will be absorbed by the earth and readmitted into the atmosphere as heat or Infrared light. Once re-admitted The ~~a~~ portion of the Infrared light will be trapped in the earth atmosphere by greenhouse gases (CO_2, Methane, water vapor). once the Infrared is re-reflected in by these gases. It will be sent back down to the surface to eather reflect of be re-absorbed and sent back in to the atmosphere again. These Infrared light trapped in the atmosphere by the gases is what keeps the earth warm when the Sun goes away at night.

B.) What Volcanism would I do is it would keep out the radiation from the Sun so there would not be as much radiation to be reflected or absorbed and readmitted into the atmosphere. It is hard to say exactly ~~of the Earth~~ what the earth's atmospheric temperature would do though. It depends on the emissions and greenhouse gases. If there was a decline in greenhouse gases then the temp would drop drastically because ~~there is nothing~~ there is nothing to hold in the little bit of re-admitted sun light. If greenhouse gase continued to rise then the temps on earth would probably stay the Same because they would be able to retain More Infrared light.

25

1 Extra credit (2 points).
How are evaporation and degassing similar and/or different? Evaporation and degassing are kind of the Same and also different. Evaporation takes the a whole liquid molecule and turns it into a gas. while degassing seperates the molecule and only extracts the gas particles out. leaving the liquid - degassed.

Negative feedback: When it comes to ocean acidification. It seems apparent that more Carbon would obviously mean that pH Levels in the ocean would rise. When infact that is not entirely true. An Increase in Atmospheric Carbon dioxide would most likely lead to an Increase in atmospheric temperature. Which means it would be harder for ocean acidification to occur because the water would become warmer. So Ocean Acidification is easier in cold water so the rise in atmospheric temperature would mean a Negative feed back in the the rise in carbon dioxide for ocean acidification

Earn up to 1 additional point on your course grade

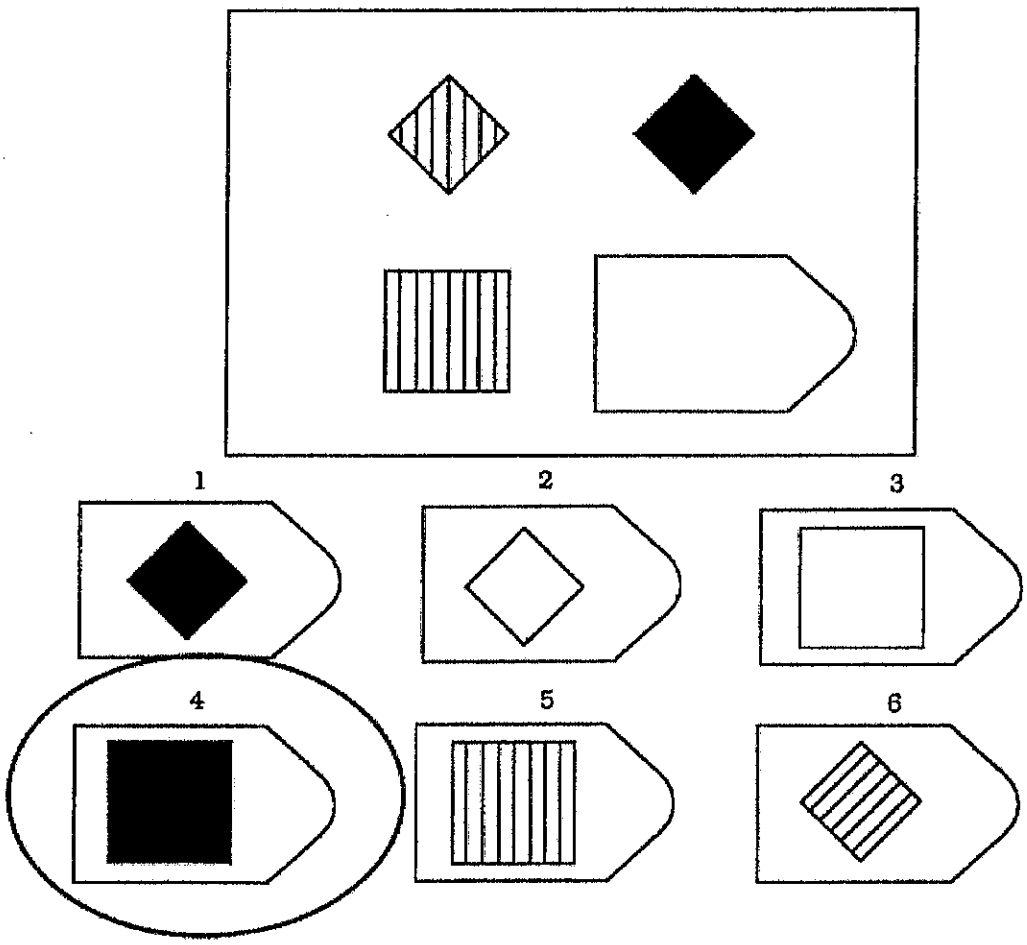
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form A Test 1 Student ID A43030607

Please choose the image that best completes each of the following patterns.

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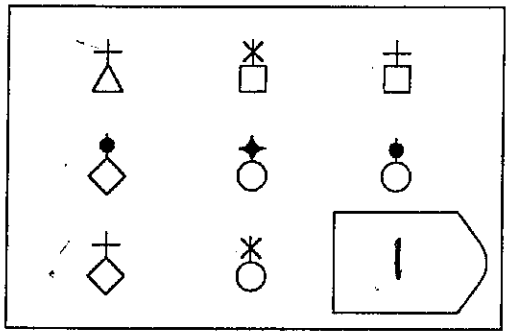

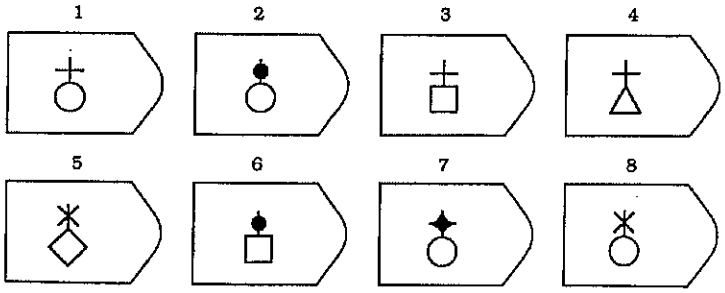

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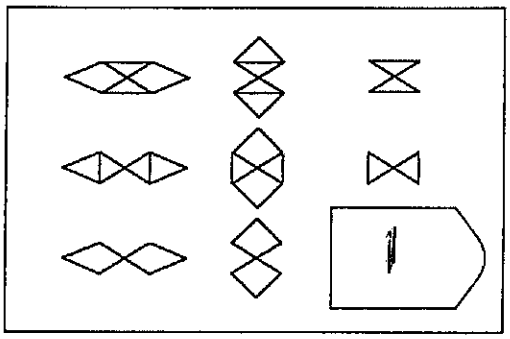

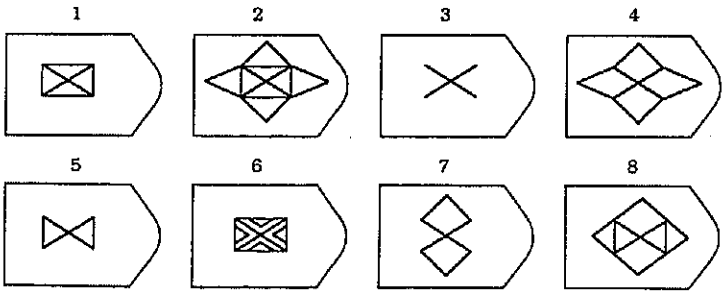

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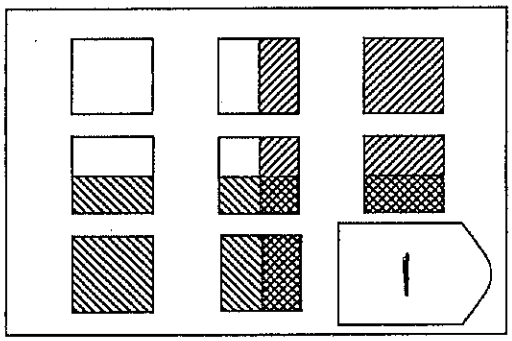
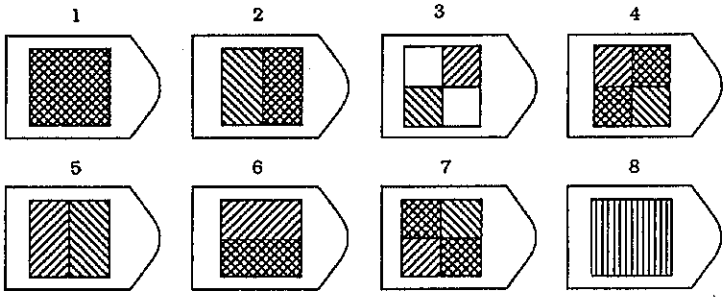
PATTERN 3





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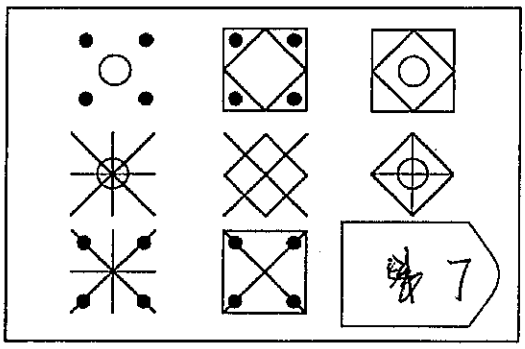

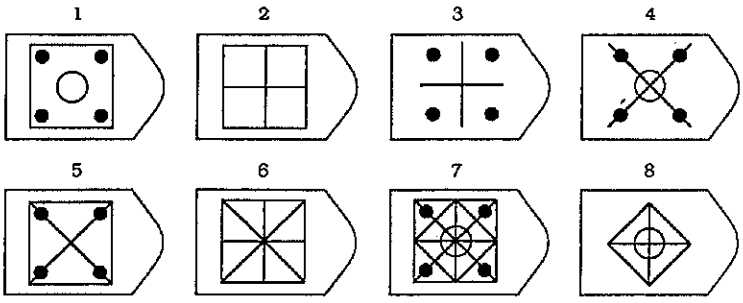

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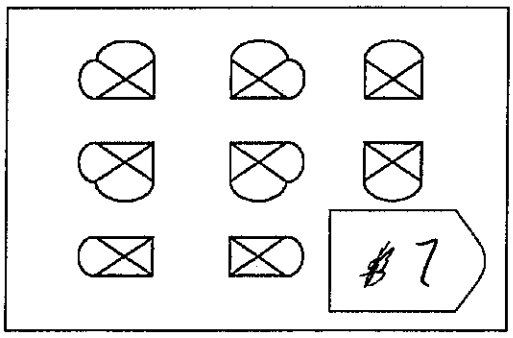
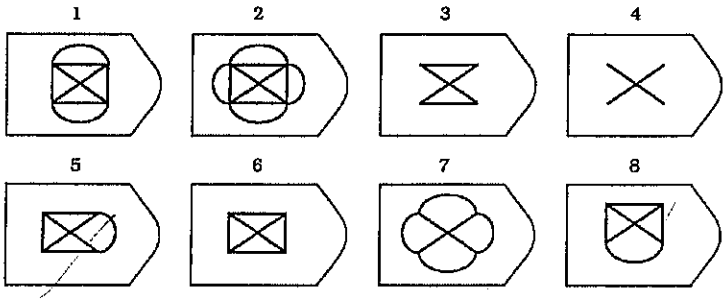
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

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5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

(D.) The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

(A.) An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

(A.) Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 19 **years**

What is your home zip code? 10533

What is your gender?

✓ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
✓ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41417295 **GROUP:** 18
Version A

87

MULTIPLE-CHOICE. 5 points each (50 points total).

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3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

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SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

A) OCEAN ACIDIFICATION IS CAUSED BY THE INTERACTIONS BETWEEN H_2O + CO_2. THIS CAUSES HYDROGEN IONS TO BE RELEASED WHICH INCREASE THE ACIDITY OF THE OCEANS. CO_2 LEVELS ↑ IN THE ATMOSPHERE + CO_2 LEVELS IN THE OCEAN ARE RELATED RESOURCES, + INCREASING THE CO_2 LEVELS OF THE ATM WOULD CAUSE MORE CO_2 TO ENTER THE OCEAN, THEN ↑ INTERACT W/ H_2O + FORM HCO_3 + H IONS, MAKING THE OCEAN MORE ACIDIC.

B) IT IS difficult TO SAY IF THIS WOULD CAUSE A NEGATIVE FEEDBACK OR POSITIVE FEEDBACK LOOP ON OCEAN ACIDIFICATION BECAUSE OF THE RELATIONSHIP BETWEEN TEMPERATURE, + THE OCEANS ABILITY TO ABSORB CO_2. COLDER WATER CAN HOLD MORE THAN WARM WATER. BECAUSE CO_2 IS A GREENHOUSE GASS, INCREASED LEVELS IN THE ATMOSPHERE WOULD CAUSE A TEMP RISE, + MAKE THE OCEANS WARMER (THIS IS A NEGATIVE FEEDBACK LOOP) DECREASING THEIR ABILITY TO HOLD IONS. OVERALL THE LEVELS OF CO_2 ENTERING THE OCEAN EVEN AT HIGHER TEMP WOULD MAKE THE OCEAN MORE ACIDIC, OVERALL.

25

CONTINUED ON 5 →

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Greenhouse effect: Earths atmosphere is heated by the energy from the sun (visible, IR, & UV light). When this light enters our atm, greenhouse gasses, like CO_2, allow the visible light to pass through to the Earths surface where it is absorbed. Some of that visible light will bounce off the surface, clouds, or ice back through the g.g.'s & into space. The light that is absorbed by the surface is re-emitted as IR light, or heat energy. Greenhouse gasses absorbe IR light unlike visible light, then they get excited, & re-emite the IR in all directions. Losing some to space, but some goes back to Earth & repeats the process again.

25

Volcanos: The effect volcanos have on the atmospheric temp is through emission of greenhouse gasses, & ash that blocks light from getting to the Earth surface.

If a volcano erupted a large ash cloud that cloud would block a lot of light from reaching the surface & being absorbed & re-emited as IR & heat energy, significantly slowing warming & the greenhouse effect. However, the ash would eventually

CONTINUED →

7 **Extra credit (2 points).**
How are evaporation and degassing similar and/or different?

Evaporation is water changing through thermal & chemical energy to gas, degassing is the removal of gas that was dissolved within

Short Answer 1) This would cause the ocean to become saturated, & not allow more CO_2 from the atm to enter, causing positive feed back for the CO_2 in the atm & global temp.

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

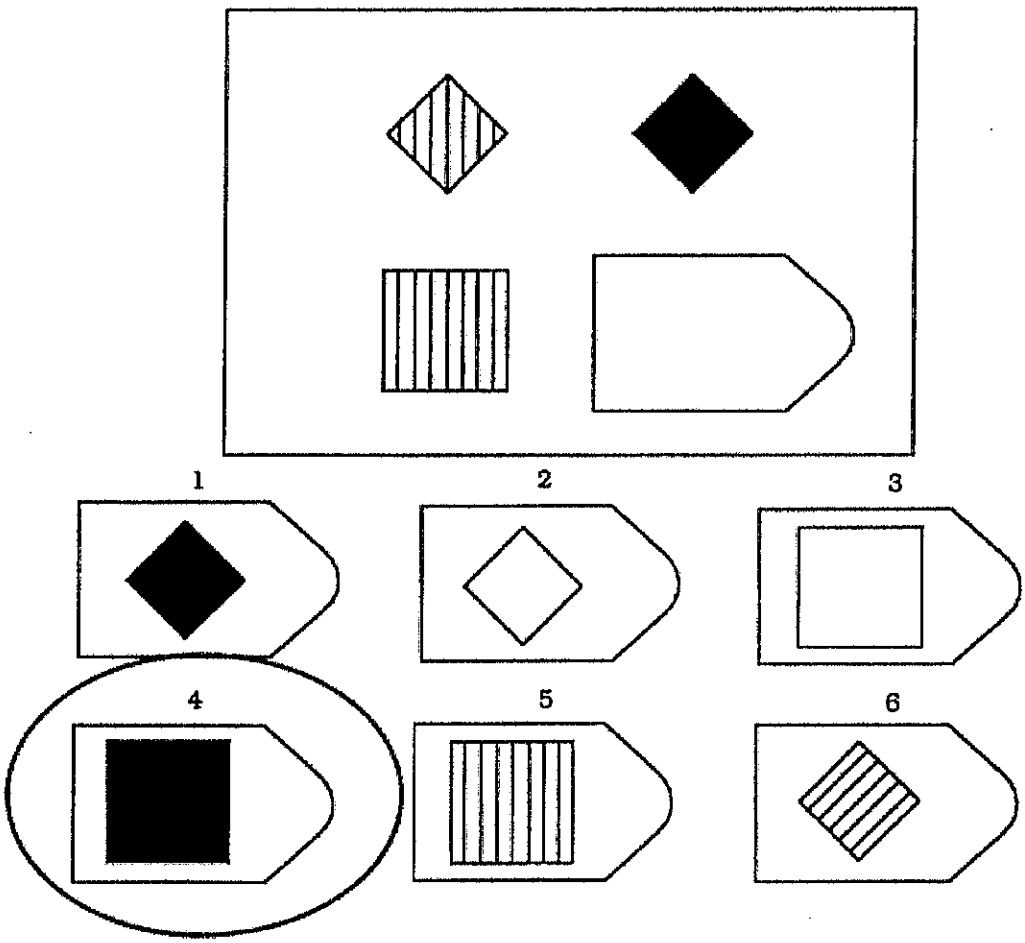
Thoughtfully complete the attached survey

Short Answer 2) This & settle, again allowing light to get to the surface of the earth. Now the gasses that the eruption emitted come into play trapping more IR light, contributing to the green house effect, & warming the planet more.

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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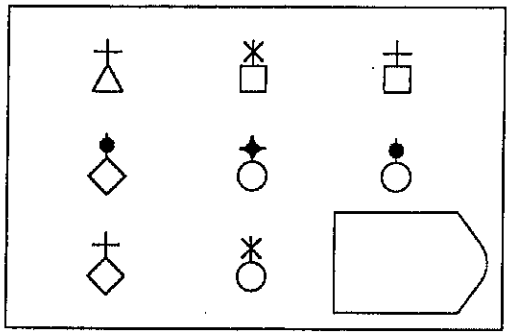
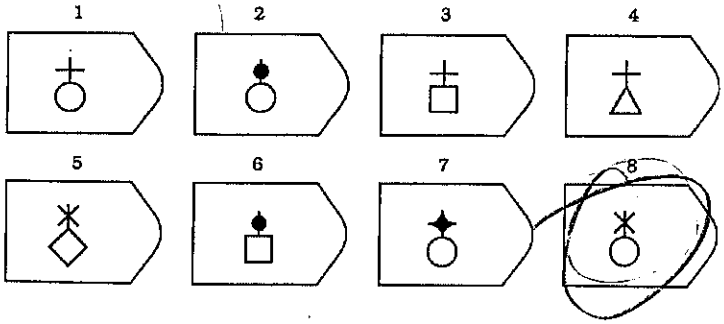
Form A Test 1 Student ID _____

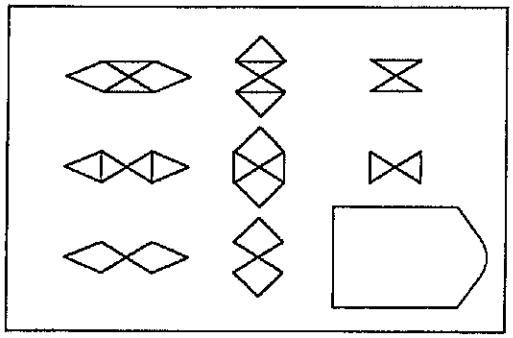
Please choose the image that best completes each of the following patterns.

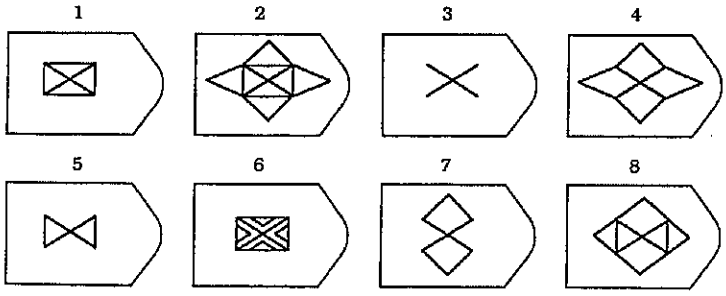
PATTERN 1





PATTERN 2





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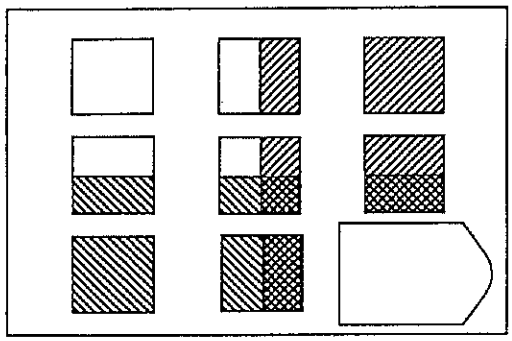
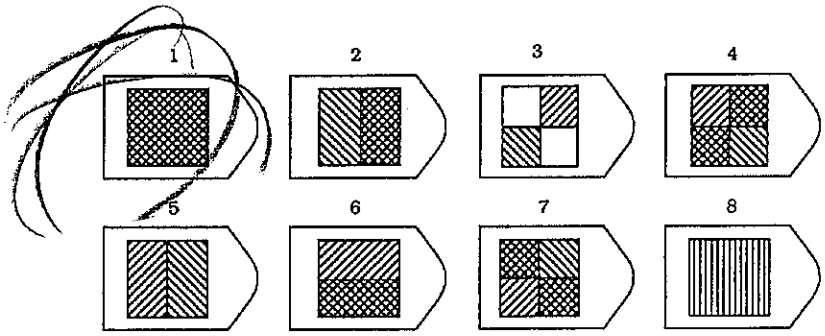
PATTERN 3





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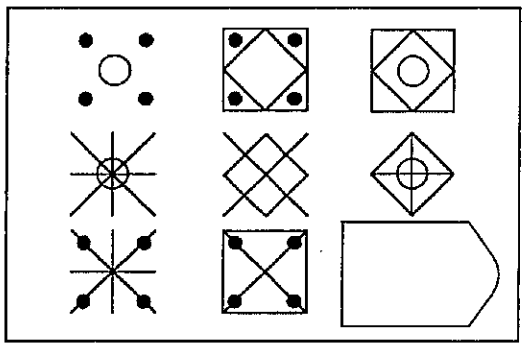

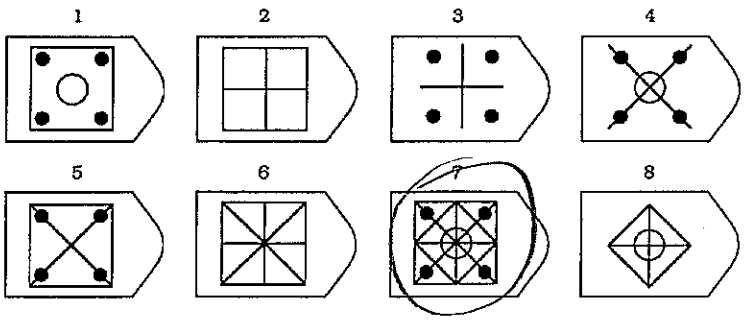

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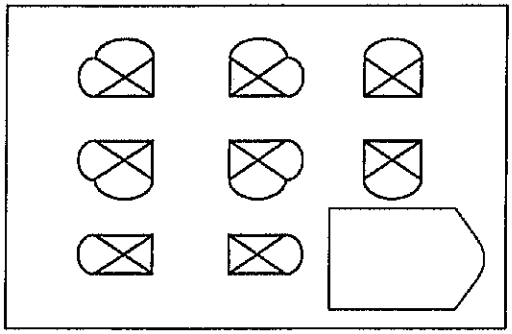
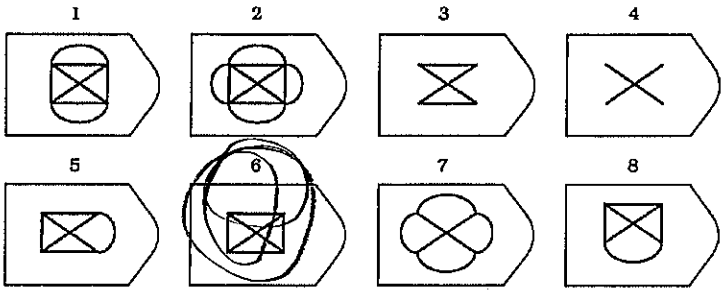
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 48103

What is your gender?

✓ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
✓ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A91860512 **GROUP:** 19
Version B

90

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere
   → presumably reflecting more visible light, cooling Earth, leading desert formation

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma – degassing → less dense
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect. human activities add to GHG, but not a natural process
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease Albedo Effect!
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

If there were an increase in atmospheric carbon dioxide, there would be a corresponding increase in ocean acidification. When one reservoir increases in size, it exchanges more with other reservoirs, in effect increasing their size. So, if there were more CO_2 in the atmosphere, that CO_2 would also go into the ocean in order to maintain equilibrium. When CO_2 is in water, it may react with water molecules to form HCO_3 and a hydrogen molecule, as seen in:

$$CO_2 + H_2O \longleftrightarrow HCO_3 + H$$

HCO_3 is a negatively charged molecule, which is responsible for acidification. So, more CO_2 in the atmosphere would lead to more CO_2 in the ocean, more production of HCO_3, and higher levels of ocean acidity.

With higher levels of HCO_3, it is possible that there could be more $CaCO_3$ formed by marine animals as shells, which would change the balance and cause more CO_2 to enter the ocean and ultimately form HCO_3 and then $CaCO_3$. However, if there is too much HCO_3 in the ocean, it will damage these marine creatures and not be used, filling the ocean with HCO_3 and CO_2, increasing the oceans reservoir and forcing exchange of CO_2 to the atmosphere to rectify the imbalance.

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2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

With an increase in volcanism, large amounts of ash (CO_2) would be spewed into the atmosphere. It would likely take a long time for the ash to settle out. The ash would do a couple of things. Firstly, it would cloud out much of the sun's rays, reflecting high amounts of visible light before they got to the surface. In doing this, the sun's rays would not get to the Earth and could not be re-radiated as heat, thus cooling the Earth significantly. At the same time, it is quite likely that the ash would work like a greenhouse gas, absorbing heat re-radiated from the Earth and radiating it back into the atmosphere, heating the Earth a little. It is most likely that more solar rays would be reflected than re-radiated heat would be absorbed, but the cooling caused might not be quite as bad as it would thanks to that.

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2 **Extra credit (2 points).**
How are evaporation and degassing similar and/or different?

Evaporation and degassing are similar in that they both involve matter moving from the hydrosphere to the atmosphere. However they are different because evaporation, water turns from liquid to gas while in degassing CO_2 ~~gas~~ moves out of liquid.

Earn up to 1 additional point on your course grade

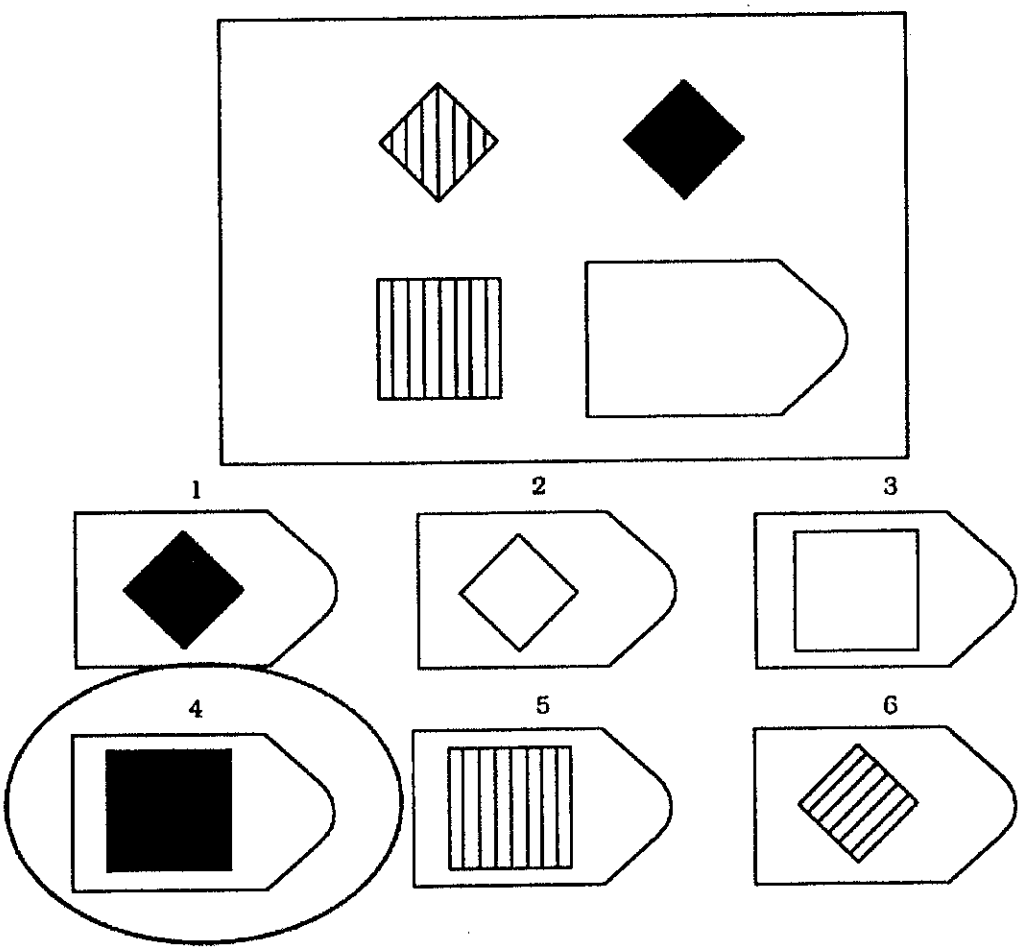
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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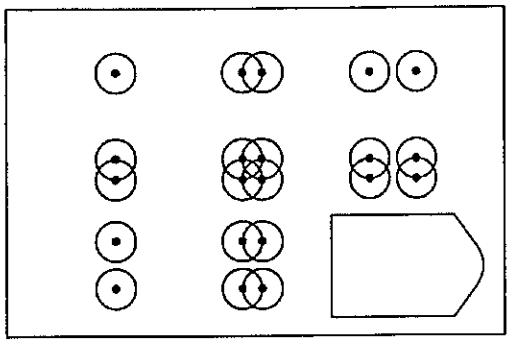
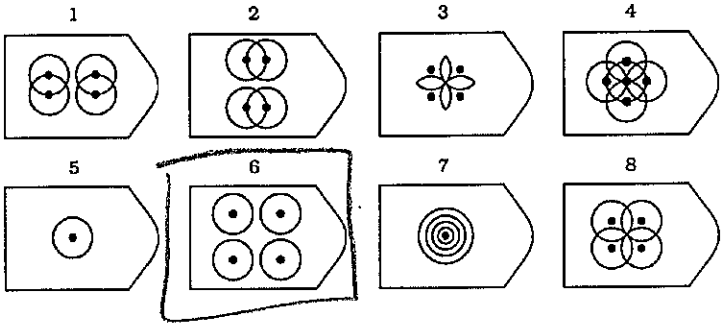
Form B Test 1 Student ID _____

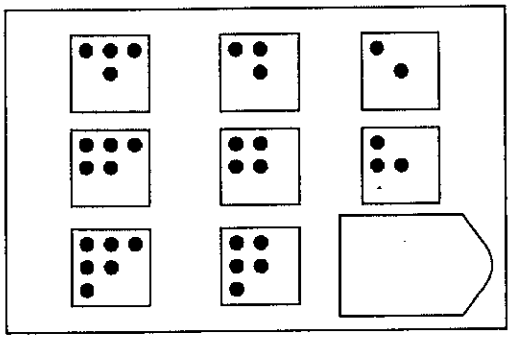
Please choose the image that best completes each of the following patterns.

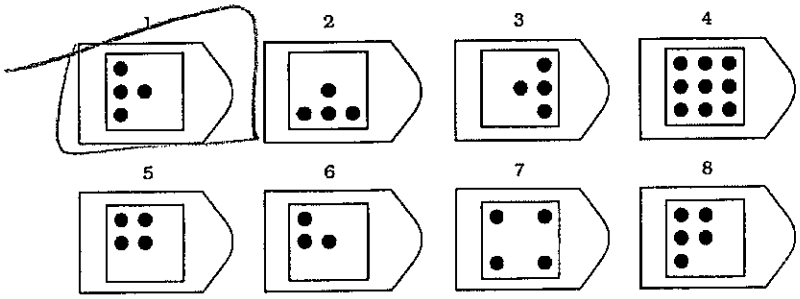
PATTERN 1





PATTERN 2





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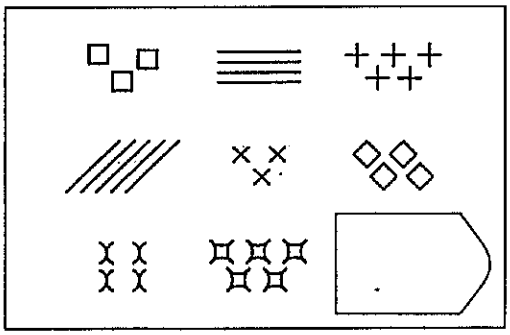
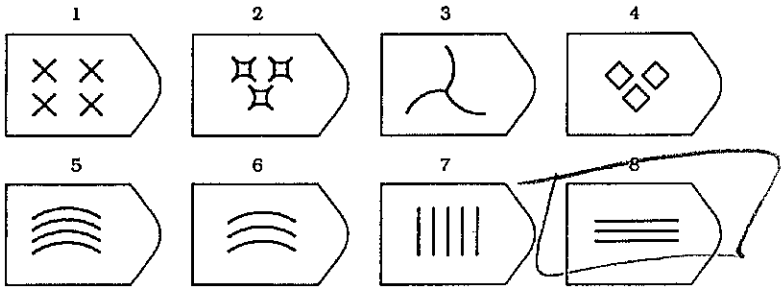
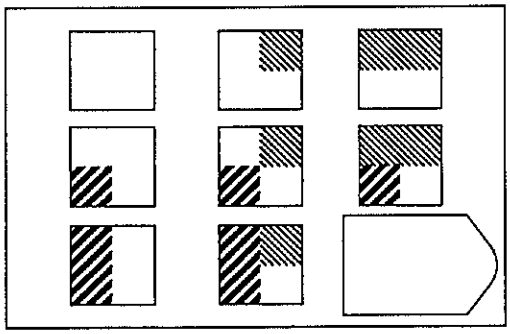
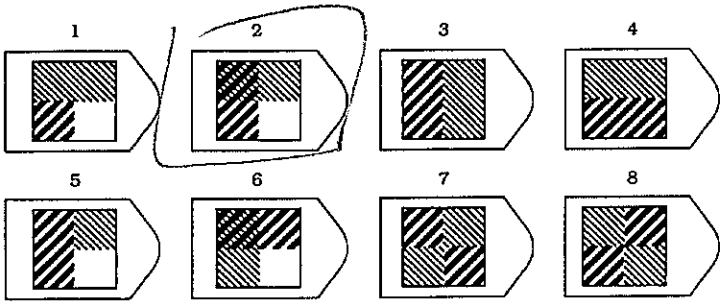
PATTERN 3





PATTERN 4





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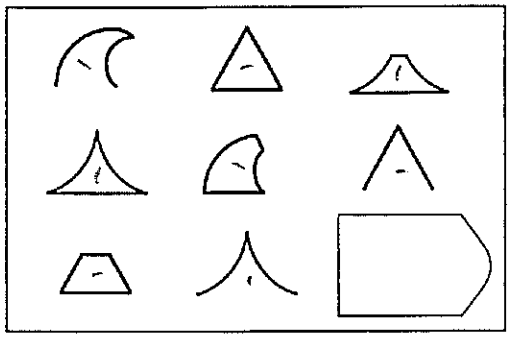
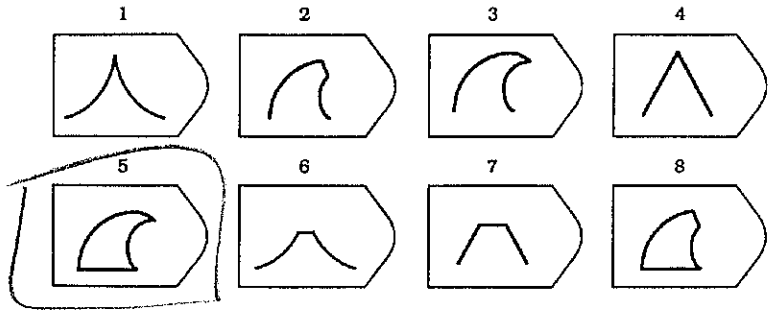
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48103

What is your gender?

✓ Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
✓ Caucasian/White
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42257459 **GROUP:** 19
Version B

34

MULTIPLE-CHOICE. 5 points each (50 points total).

D **1.** Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

B **2.** Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
b. Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

D **3.** Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of ____C____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

C **4.** Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

B **5.** Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
b. Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

A **6.** Which of the following would cause the acidity of Earth's oceans to decrease?
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B 7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

A 8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

A 9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

C 10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

A41225745?

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

AN INCREASE IN ATMOSPHERIC CARBON DIOXIDE WOULD AFFECT OCEAN ACIDIFICATION BY FIRST DECREASING OCEAN ACIDIFICATION. THE RISE IN ATMOSPHERIC CARBON DIOXIDE WOULD RESULT IN THE POSITIVE FEEDBACK OF INCREASED ATMOSPHERIC TEMPERATURE. AS A RESULT OF THIS INCREASED ATMOSPHERIC TEMPERATURE, ANOTHER POSITIVE FEEDBACK WOULD OCCUR IN WHICH THE RATE OF OCEAN EVAPORATION WOULD ALSO INCREASE. AS A RESULT OF THIS INCREASED OCEANIC EVAPORATION, MORE CLOUDS WOULD FORM → ANOTHER POSITIVE FEEDBACK. AS A RESULT, MORE OF THE SUN'S SOLAR RADIATION WOULD BE REFLECTED BACK INTO SPACE, WHICH WOULD CAUSE A DECREASE IN THE AMOUNT OF SOLAR RADIATION BEING ABSORBED BY THE PLANET → A NEGATIVE FEEDBACK. THIS WOULD ALSO CAUSE THE OCEANS TO BECOME COLDER, & THUS, ABLE TO ABSORB MORE CARBON DIOXIDE FROM THE ATMOSPHERE, WHICH WOULD BRING THE SYSTEM BACK INTO EQUILIBRIUM.

2

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

IF VOLCANISM ON EARTH WERE TO SUDDENLY INCREASE DRASTICALLY, & THE SPEWING OF LARGE ASH CLOUDS WERE TO ALSO INCREASE IN RELATION, EARTH'S TEMPERATURE WOULD INITIALLY DECREASE. THE SULFUR FROM THE VOLCANIC ERUPTION WOULD CREATE MORE CLOUDS IN THE ATMOSPHERE RESULTING IN MORE REFLECTION OF THE SUN'S SOLAR ENERGY BACK INTO THE ATMOSPHERE. HOWEVER, THE SOLAR ENERGY THAT REMAINS WOULD ALSO BE "TRAPPED" WITHIN THE ATMOSPHERE WITH THE INCREASE IN VOLCANIC CLOUDS, & WOULD BE REFLECTED & TRAPPED WITHIN EARTH'S ATMOSPHERE. INCREASINGLY TRAP. SO BOTH A POSITIVE & A NEGATIVE FEEDBACK WOULD OCCUR SIMULTANEOUSLY. OVER TIME, THE CLOUDS WOULD DISSIPATE, BUT THE SULFUR & CARBON MOLECULES WOULD STILL REMAIN IN THE ATMOSPHERE. THIS WOULD RESULT IN THE INCOMING SOLAR ENERGY TO BE TRAPPED WITHIN EARTH'S ATMOSPHERE, AS THE INCREASE IN CARBON MOLECULES WOULD ACT AS A KIND-OF BARRIER OR SHIELD, TRAPPING IN MORE SOLAR ENERGY THAN NORMAL, WHICH WOULD CAUSE AN INCREASE IN EARTH'S TEMPERATURES UNTIL THE SYSTEM WOULD BE BROUGHT BACK INTO EQUILIBRIUM

2

Extra credit (2 points).
How are evaporation and degassing similar and/or different?
EVAPORATION IS THE PROCESS BY WHICH WATER MOLECULES LEAVE ITS OCEAN RESERVOIR & DEGASSING IS WHEN THE GASES & SULFUR MOLECULES LEAVE THEIR RESERVOIR. THE ACTION OF THEIR LEAVING IS THE SIMILARITY; HOWEVER, EVAPORATION DEALS WITH WATER &

Earn up to 1 additional point on your course grade

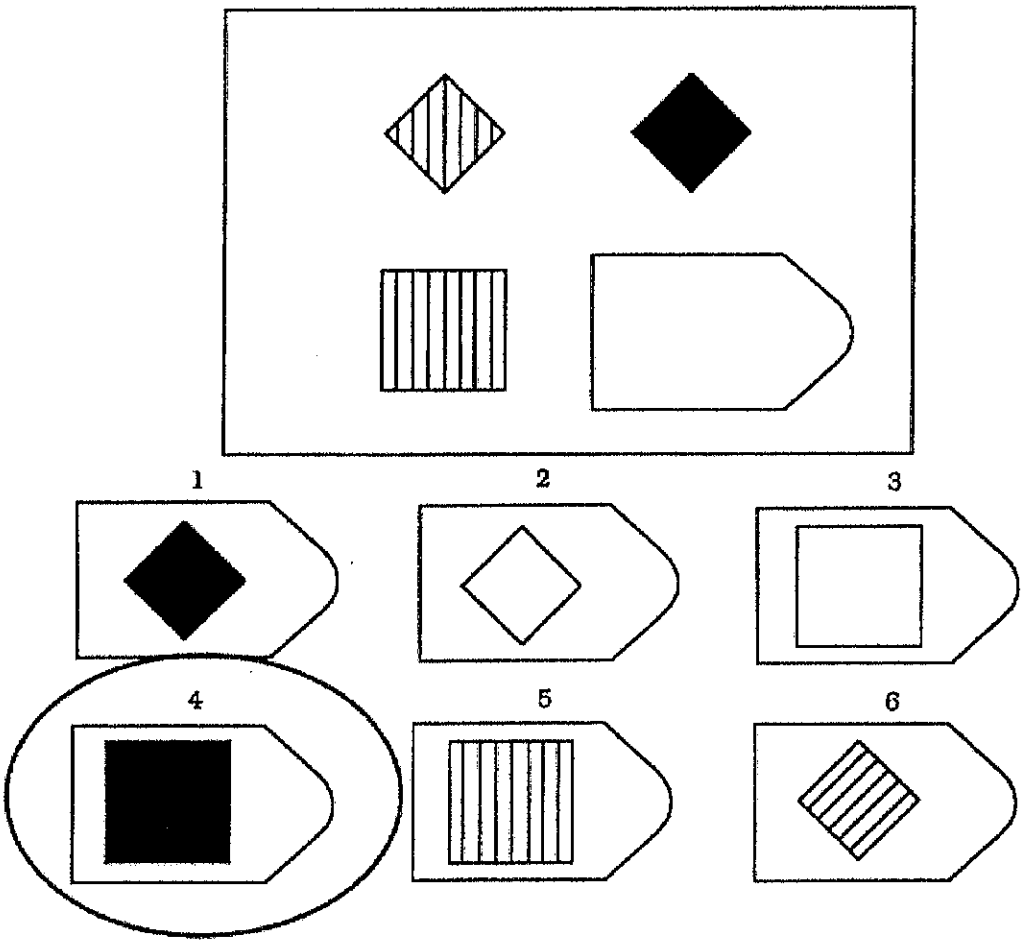
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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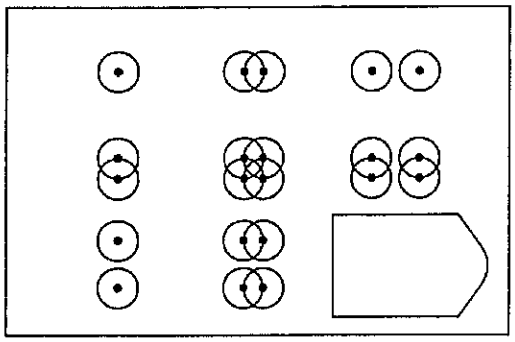

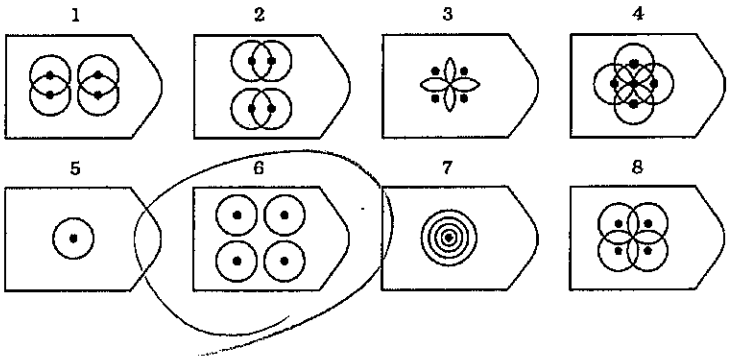

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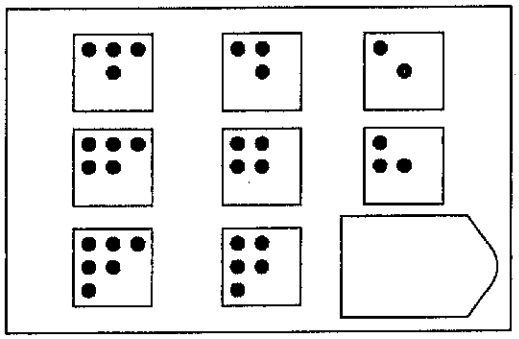

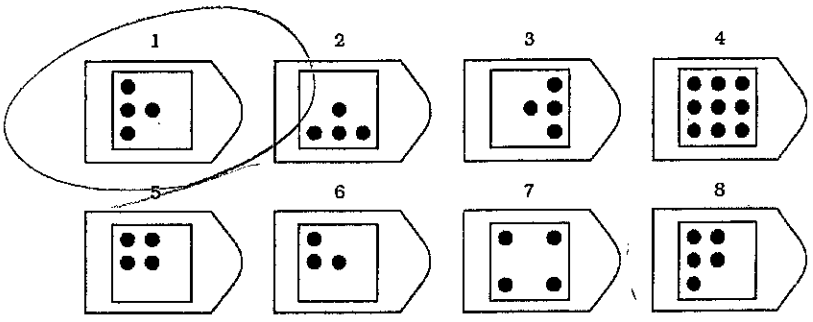

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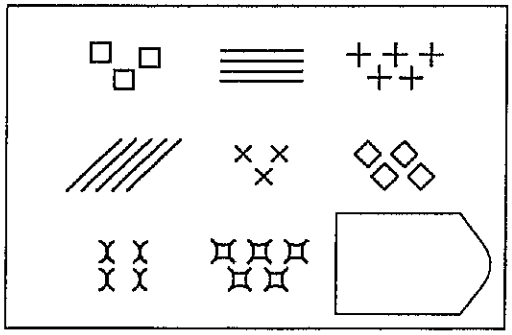

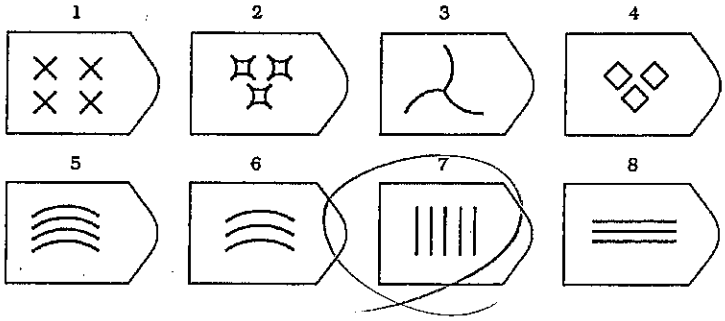

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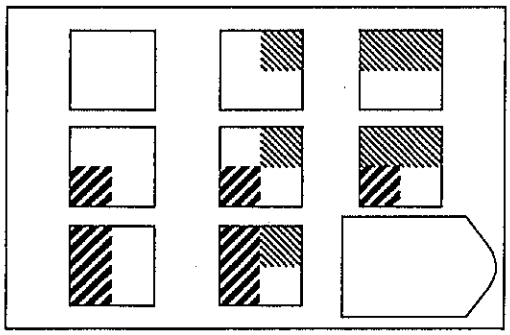

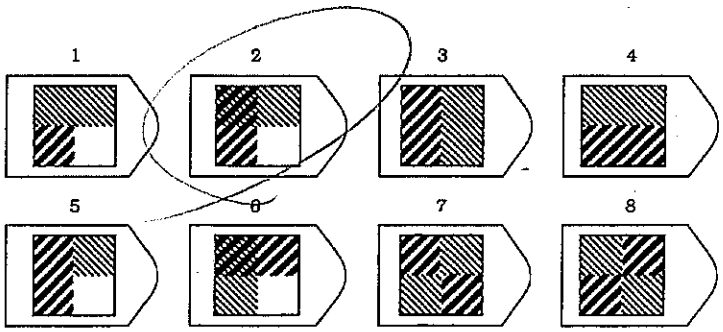

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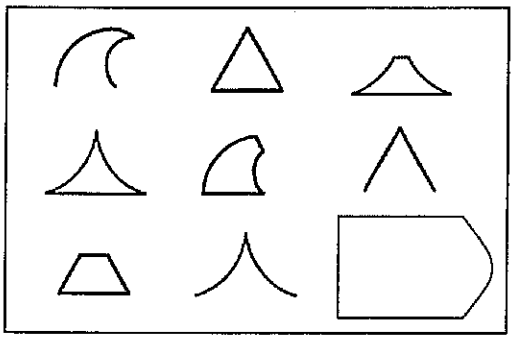

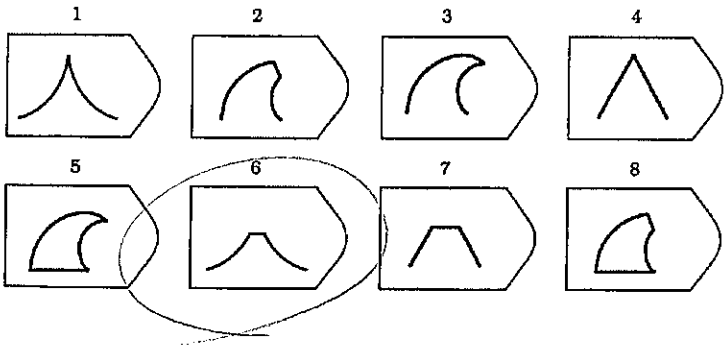

In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

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B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 25 **years**

What is your home zip code? 48910

What is your gender?

✓ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
✓ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A4074 9278 **GROUP:** 19
Version B

62

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
C (c.) An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
b (b.) Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of uplift C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
C (c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
C (c.) Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
B (b.) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

RT = volume / in-out put

6. Which of the following would cause the acidity of Earth's oceans to decrease?
a (a.) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
(b.) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

b

RT = volume / in-output

1000 / 50 = 250

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
(c.) The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

c

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

(a.) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

a

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
(b.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

b

A40749278

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$
b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in atmospheric carbon dioxide would increase the amount of ocean acidification taking place. The atmosphere & ocean are always trying to maintain similar levels of CO_2. If one has a significantly higher amount, due to the process of de-gassing, it will release some of the CO_2 to be absorbed by the other. If there was an increase in the CO_2 in the air, over time, there would also be an increase in the CO_2 in the water because the two are trying to stay balanced.
For a positive feedback loop, there would be a steady continuous increase of CO_2 in the atmosphere & therefore the same would be true for the oceans.
For a negative feedback loop, there would no longer be an increase of CO_2 in the atmoshere, which would decrease both levels of CO_2 in the water & in the atmosphere.

20

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

7.

Because of the increase in volcanoes, the overall Earth's temperature would increase. The ash would cover the floor of the Earth's surface & therefore the thermal heat created by the sun's waves would be absorbed into the Earth's surface rather than it just bouncing off the surface & returning outside of the Earth's atmosphere. This would create a significant increase in the temperature of the Earth since the heat would be stored in the ground. With an increase in volcanic activity, there would also be more heat underground with an increase forming and releasing of magma, and once the volcano erupted, there would be an excess of thermal heat in the air. This heat would be circulated from the ground & throughout the atmosphere.

5

2

Extra credit (2 points).
How are evaporation and degassing similar and/or different?
Evaporation is a phase change (liquid to gas), while degassing is simply the transferring of gas from one substance to another.

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Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

A407492778

Form B Test 1 Student ID _____

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

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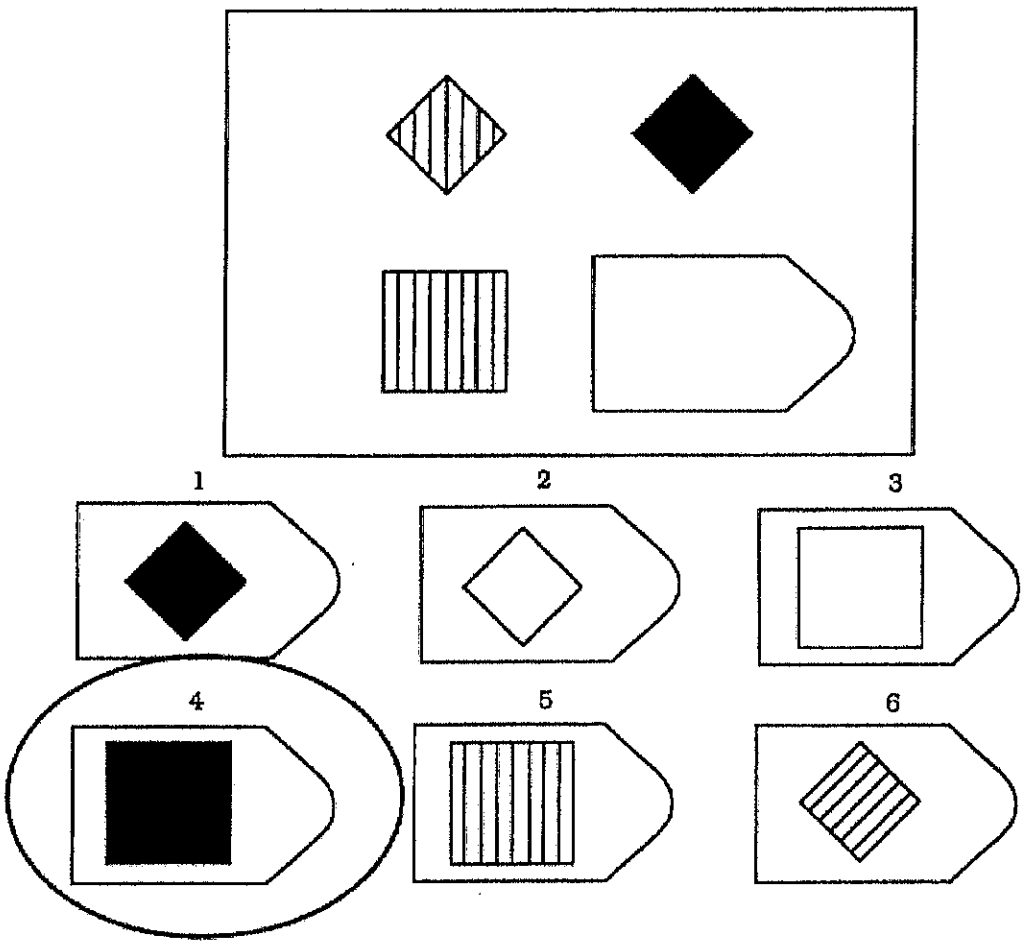

Answer: 4

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Form B Test 1 Student ID _____

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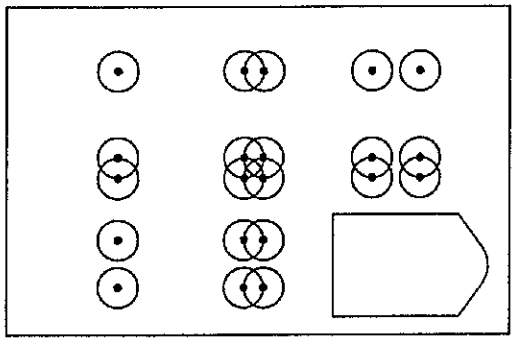

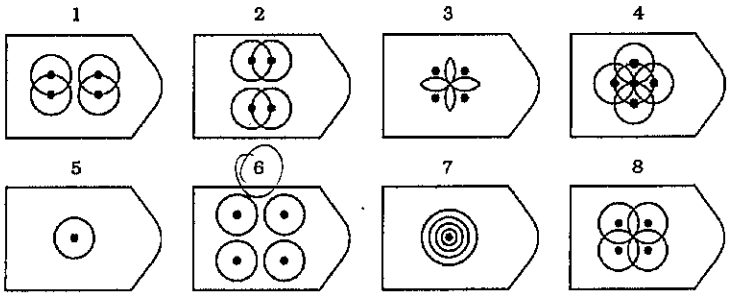

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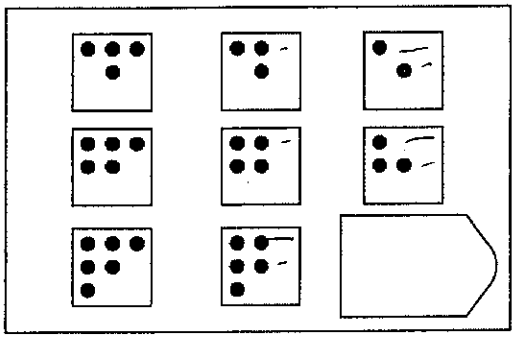

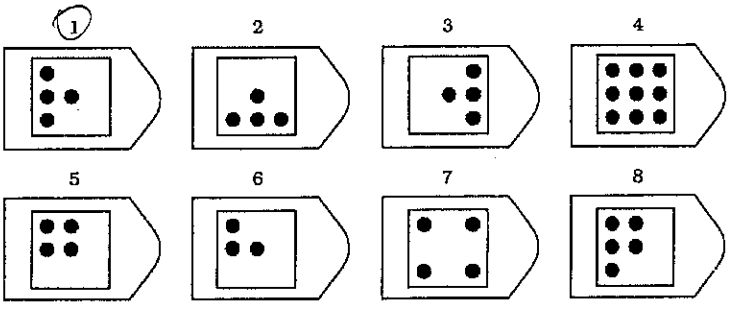

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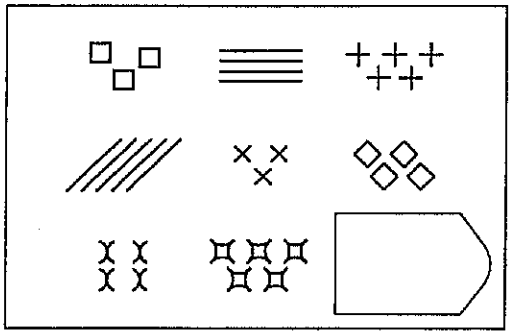

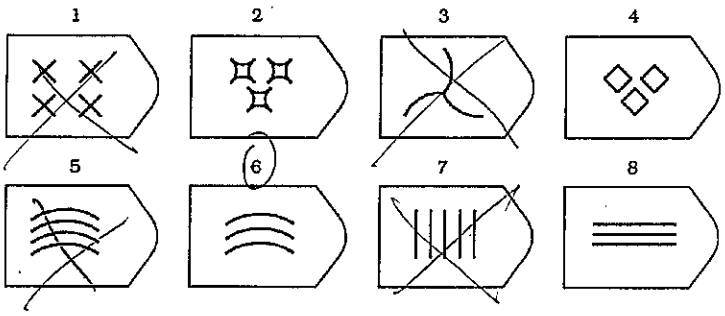

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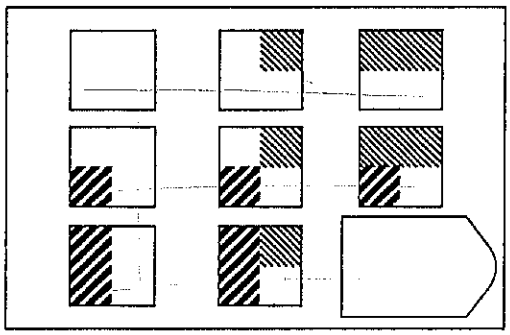

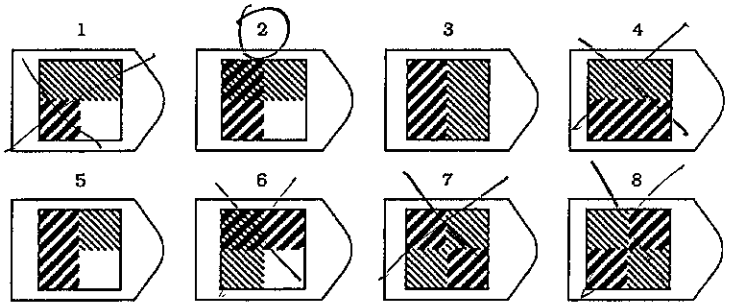

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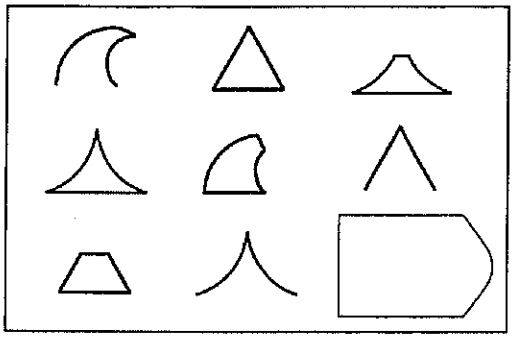

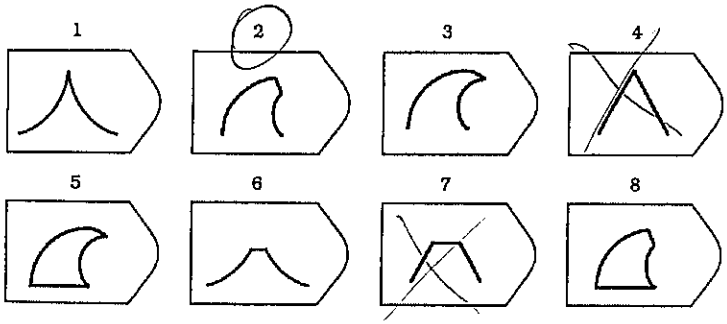

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PLEASE CONTINUE ON NEXT PAGE

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Form B Test 1 Student ID _____

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2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

(A). Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

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B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

(D). Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

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D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

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B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

(A.) Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

(C.) Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 49506

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: ~~A429~~ A40278600 **GROUP:** 19
Version B

23

MULTIPLE-CHOICE. 5 points each (50 points total).

b. 1. Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
(b.) Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

c 2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
b. Gas bubbles forming in the magma
(c.) The surrounding crust becoming hotter
d. Crystals forming in the magma

c 3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
(c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

a. 4. Which of the following statements about the greenhouse effect on Earth is most accurate?
(a.) Human activities are the primary cause of the greenhouse effect. a
b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

b 5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
(b.) Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

same inflow + outflow - equal

6. Which of the following would cause the acidity of Earth's oceans to decrease? b
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
(b.) A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

b 7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true? b

a. The reservoir will eventually disappear.
(b.) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

a 8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates? a

(a.) The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

b 9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation? b

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
(b.) Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

d 10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true? d

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
(d.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$
b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

I believe by increasing carbon dioxide in the atmosphere the ocean will become affected. It will be like the example in class with the Coca Cola and the diet Coca Cola. The water will become more dense because there is more carbon dioxide in the atmosphere. But eventually there will be a balance or equilibrium between the ocean and atmosphere. I believe that a positive feedback loop of an increase in atmospheric carbon dioxide affecting ocean acidification would be if human burned more fossil fuels it would add to the amount of carbon dioxide in the atmosphere. Also if there were no clouds blocking the sun from directly hitting the ocean then this radiation could cause positive feedback. But the opposite would cause negative feedback if people stopped driving their cars or if the clouds did appear it would block the Sun's radiation causing negative feedback.

2

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

It would affect Earth's atmospheric temperature by decreasing the temperature. This would occur because the ash clouds would be a negative feedback to temperature increase. Ash clouds would block the sun's radiation from entering the earths atmosphere. So first the volcanoes would increase temperature due to different greenhouse gases entering the atmosphere but due to a negative feedback which is the ash clouds the sun radiation would be blocked from entering the atmosphere which would decrease temp. The different greenhouse gases that I mentioned in the previous sentence would be methane, CO_2 and others but the increase in greenhouse gases would initially result in an increase in atmospheric temp.

5

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Evaporation is when temperature or heat increase causes a liquid to become a gas. For example water in a lake goes to clouds because of temp.

Degassing is when ions or gases is in a liquid and it causes the substances to mix and erupt. For example, matter in Coca Cola if you shake can and open there will be degassing.

Earn up to 1 additional point on your course grade

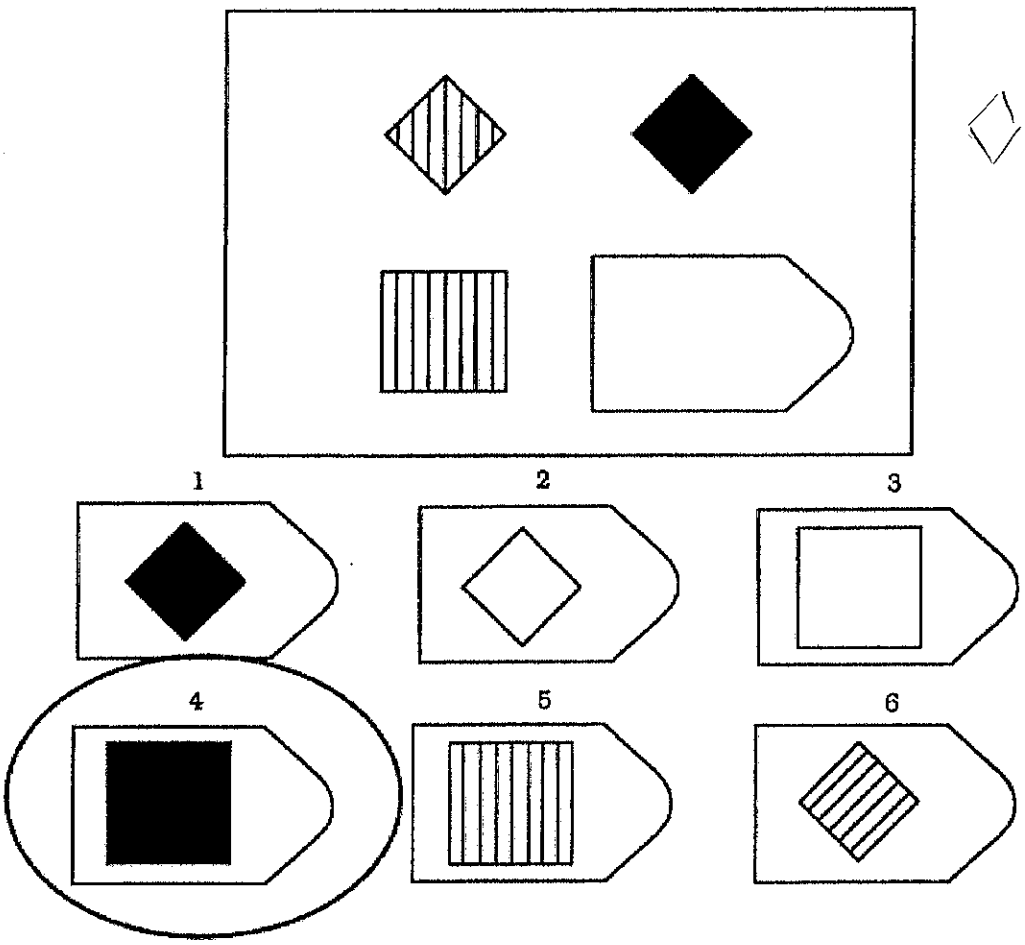
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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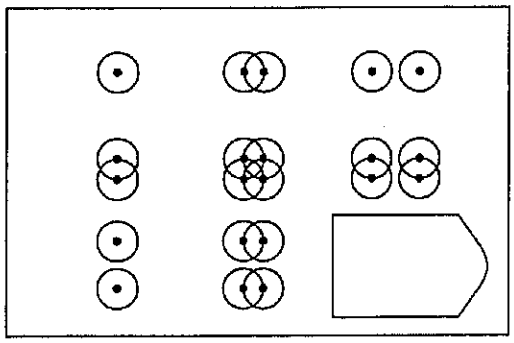
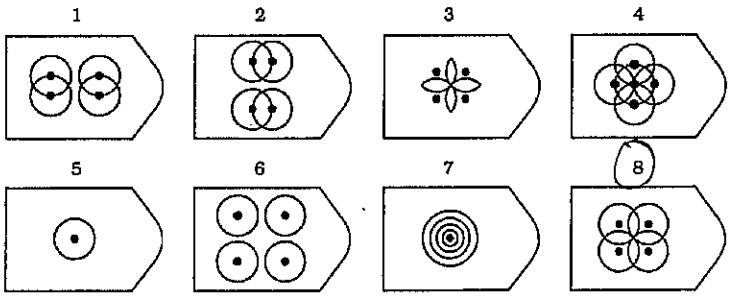
Form B Test 1 Student ID A4022107

Please choose the image that best completes each of the following patterns.

PATTERN 1 8





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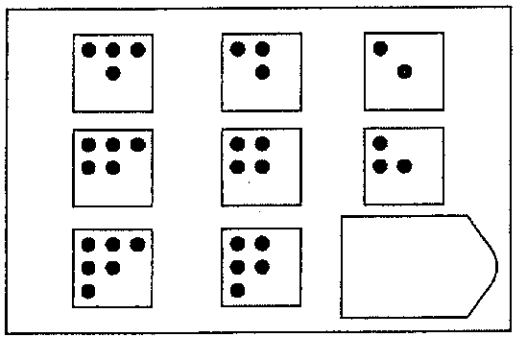

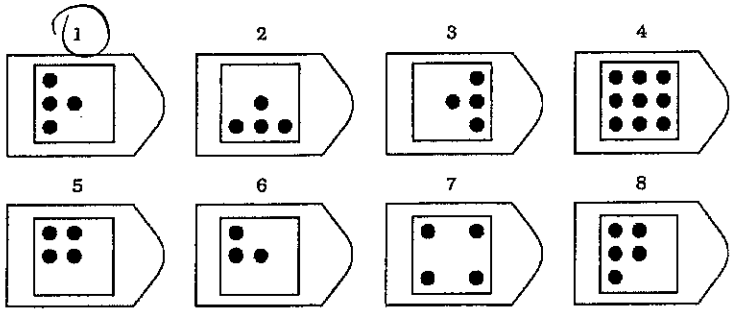

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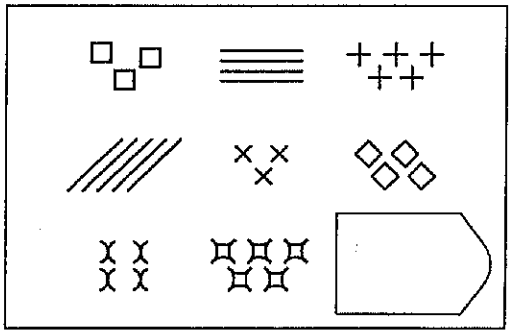
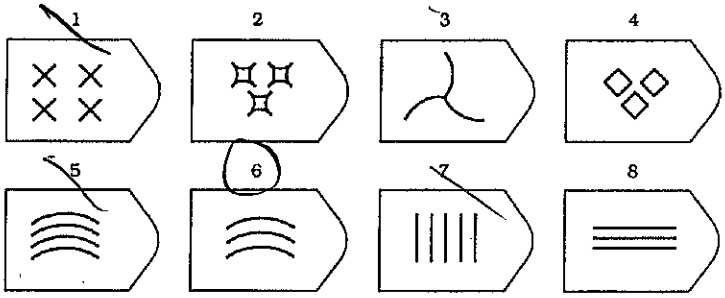
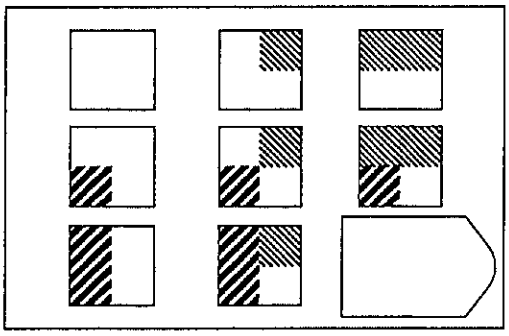
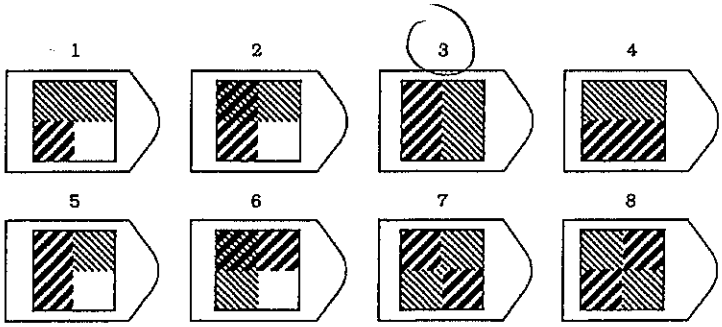
PATTERN 3 6





PATTERN 4 3





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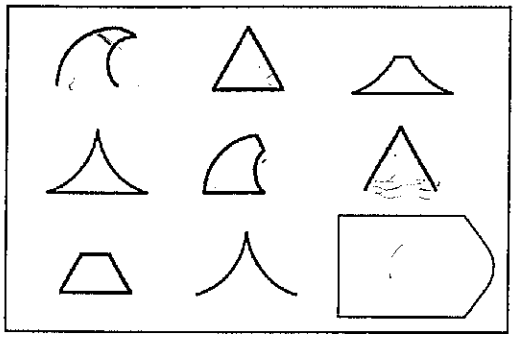
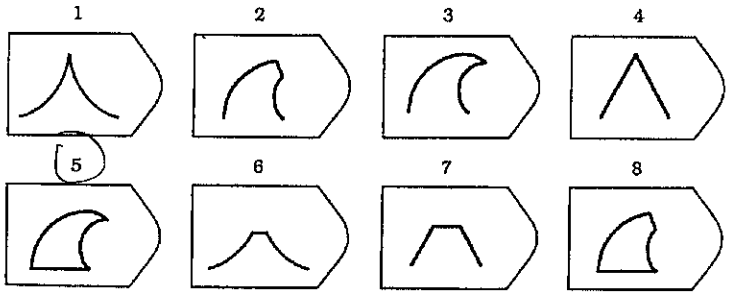
PATTERN 5

5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.

B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.

C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet. B

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week A

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand. D

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella. C

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class. A

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like... C

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like... C

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 48823

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

X African American/Black
___Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: 42213991 **GROUP:** 20
Version A

40

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
C a. The magma becoming colder
b. Gas bubbles forming in the magma
(c.) The surrounding crust becoming hotter
d. Crystals forming in the magma

2. Which of the following would be considered a negative feedback to increasing global temperature?
A (a.) Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

C a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
(c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
C b. Natural processes are the primary cause of the greenhouse effect.
(c.) Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
B a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
(b.) A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
B a. Reservoir A has a shorter residence time than Reservoir B.
(b.) Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
B (b) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

A (a) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
D b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
(d) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
D c. The Earth's atmosphere would remain about the same temperature as it is today.
(d) The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

an increase of CO_2 into the atmosphere would cause an increase in the ocean acidification as well. explain
This would cause ocean temperatures to rise, which is a positive feed back because it would increase the earth's temperature. A negative feedback that could occur would be an increase in evaporation which would form more clouds in the atmosphere blocking the suns rays cooling the earth.

5

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The greenhouse effect is the process by which the earth's atmosphere is heated. It allows some rays type from the sun into the atmosphere which can then be absorbed by the Earth's surface] while others are reflected back into space which do not heat up the atmosphere.

The ash from many volcanoes would block rays coming into the atmosphere from the sun causing the Earth to become colder however the increase in CO_2 in the atmosphere would trap more heat in causing how the Earth to become warmer. There would be a mixture of positive and negative feedbacks so it is impossible to predict if the Earth would become warmer or colder.

15

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Earn up to 1 additional point on your course grade

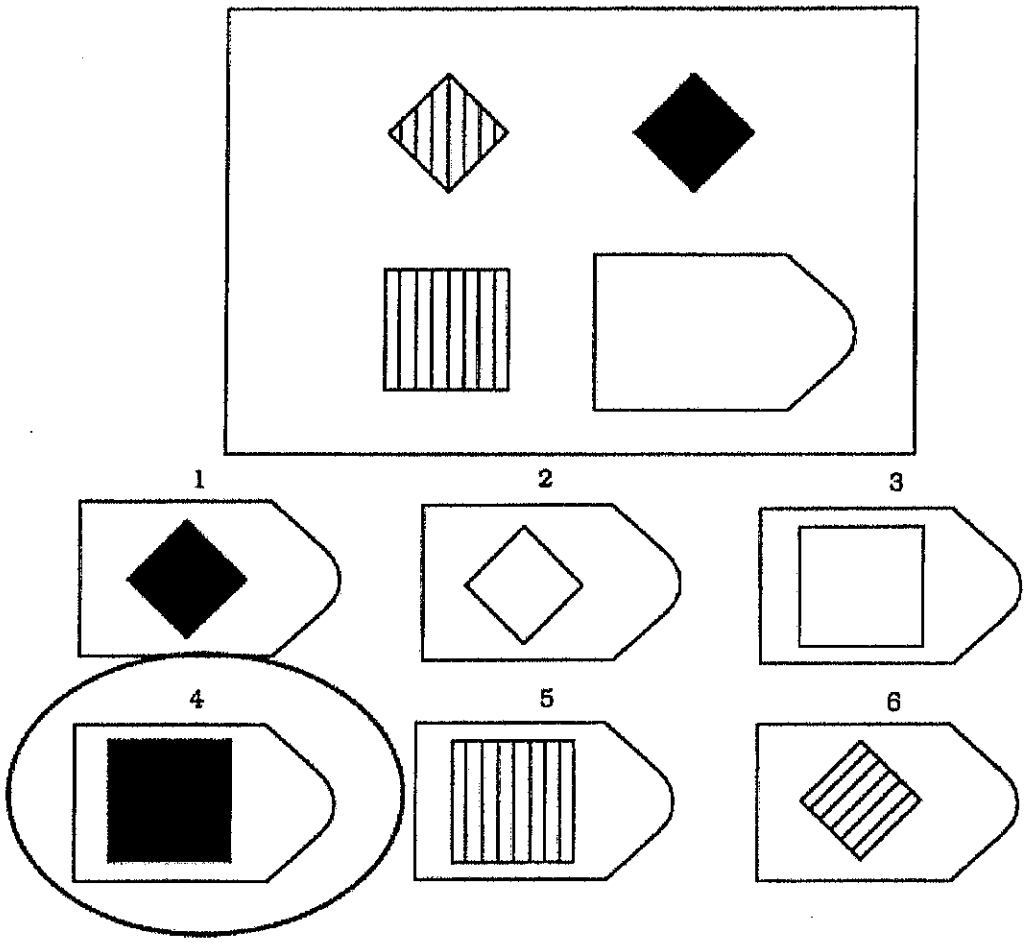
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form A Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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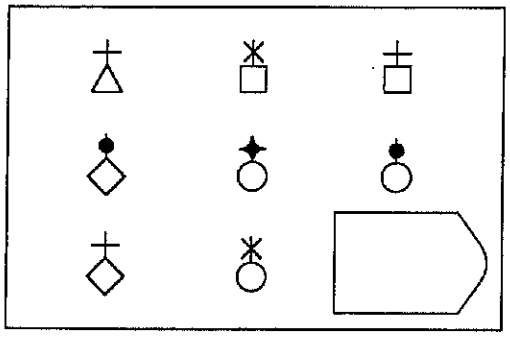

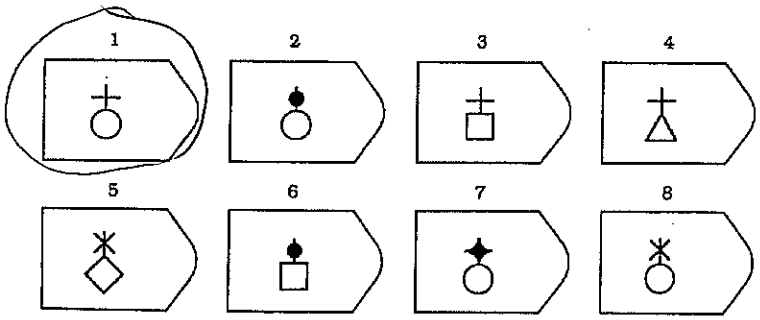

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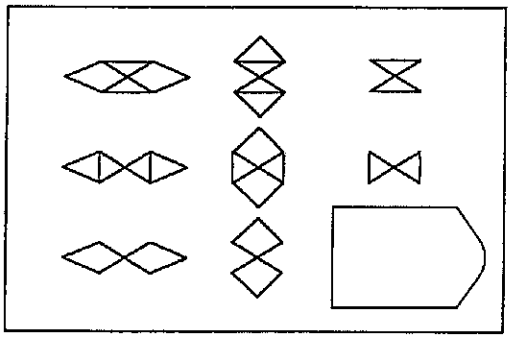

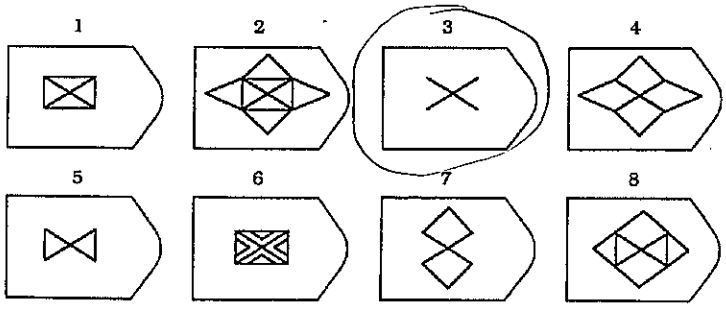

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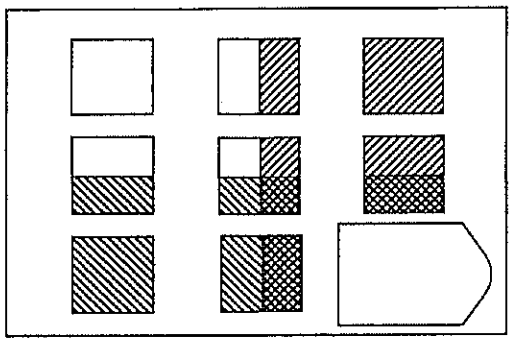

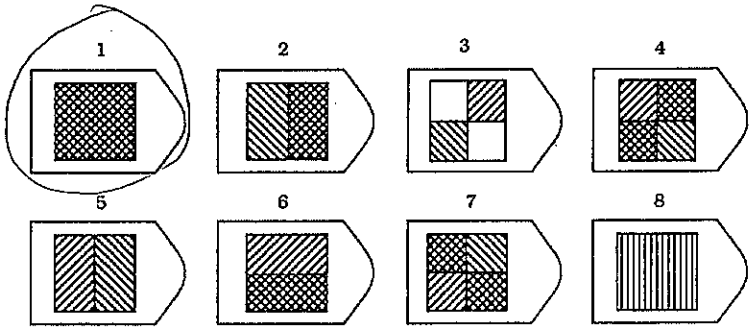

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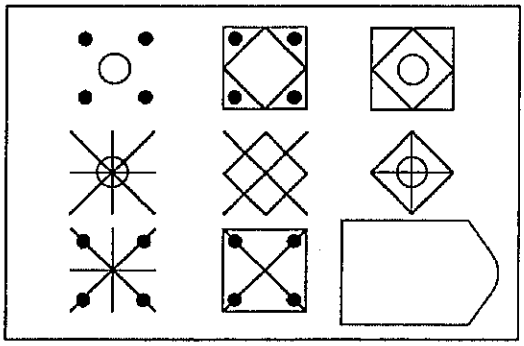

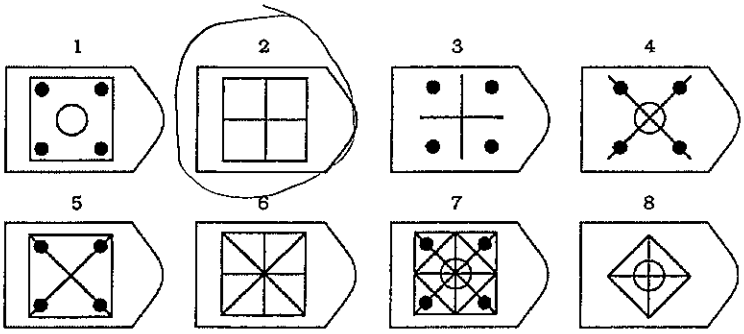

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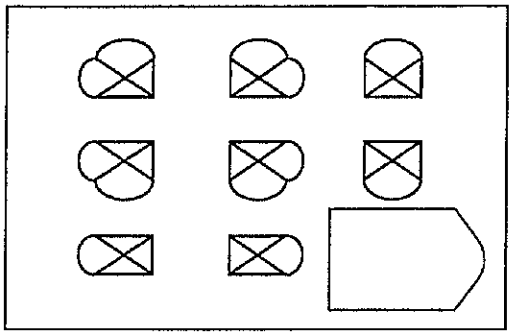
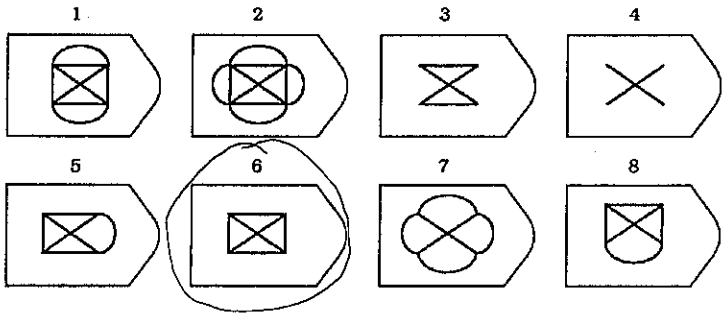
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

D C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

(D.) The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A (A.) An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B (B.) Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48462

What is your gender?

X Male

___Female

___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black

X Caucasian

___Latino/Hispanic

___Native Hawaiian/Pacific Islander

___Native American

___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41918010 **GROUP:** 20
Version A

80

MULTIPLE-CHOICE. 5 points each (50 points total).

b. **1.** Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
(b.) Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

c. **2.** Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
(c) An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

c. **3.** Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
(c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

b. **4.** Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
(b.) Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

a. **5.** Which of the following would cause the acidity of Earth's oceans to decrease?
(a) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

b **6.** Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
(b.) Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

inflow = outflow

b **7.** A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
a. The reservoir will eventually disappear.
(b.) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

a **8.** Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
(a.) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

c **9.** Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
(c.) Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

b **10.** What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
a. The Earth's atmosphere would become colder than it is today.
(b.) The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$
b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

Ocean acidification is the process in which CO_2 from the atmosphere dissolves, or goes through gas dissolution, into ocean water. The CO_2 reacts with the water, or H_2O, to form calcium bicarbonate, HCO_3, and hydrogen ions, H^+. The hydrogen ions are acidic, which is the reason why the oceans become acidic when more CO_2 is dissolved into them. ✓

If atmospheric carbon dioxide were increased, more CO_2 would be dissolved into the ocean. The excess CO_2 would create even more hydrogen ions, increasing the acidity of the ocean.

Positive feedback loops are changes that cause more change in the same direction. Negative feedback loops are changes that slow down, or stop a process completely.

In terms of ocean acidification, a positive feedback loop occurs because more CO_2 in the water would mean more could be evaporated into the atmosphere. This increases CO_2 in the atmosphere and starts the process all over again.

However, there needs to be some sort of balance and this comes into play with a negative feedback loop. If there is increased levels of CO_2 in the atmosphere, the ocean temperature would rise. A warmer ocean, can't hold as much CO_2 because of increased evaporation. So, this helps slow the process of acidification down.

25

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Volcanism, or degassing, is the process where magma erupts and releases carbon dioxide back into the atmosphere. The increase in CO_2 should increase global temperature because of the Greenhouse effect. The Greenhouse effect is a naturally occcuring process that is influenced by humans. Visible light is enters the atmosphere. Some of these infered waves are absorbed by earth's surface, heating our plant. Other are reflected back and can either be readimitted into space or absorbed by Greenhouse Gases. Common Greenhouse Gases are water vapor, methane and, most importantly, CO_2. These gases trap heat inside our atmosphere, +?
So, volcanism can raise our temperatures significantly by admitting a bt of CO_2 into the atmosphere.
However, a semi-balance is formed because of the large ash clouds. These ash clouds prevent some sunlight and infared rays from entering the atmosphere, having a cooling effect on our climate. Eventually though the ash clouds will settle out of the atmosphere, so overall, volcanism should cause an increase in atmospheric temperatures.

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Extra credit (2 points).
How are evaporation and degassing similar and/or different? X
They are similar because they both turn a liquid like substance into a gas. But, they're different because evaporation evaporation occurs with water and degassing with magma.

Earn up to 1 additional point on your course grade

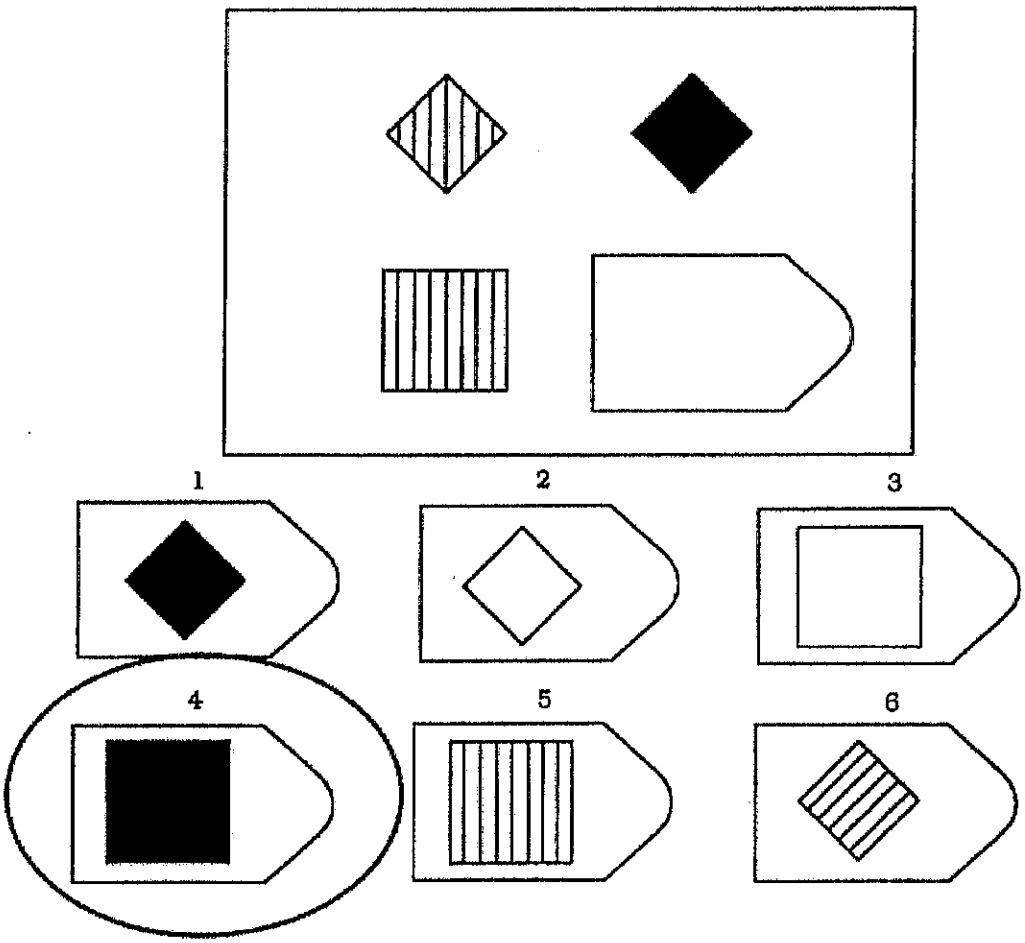
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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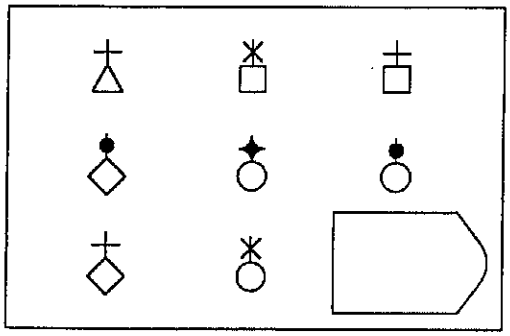
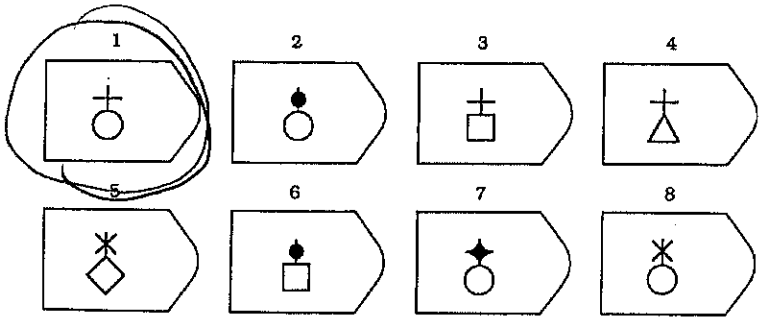
Form A Test 1 Student ID A4191810

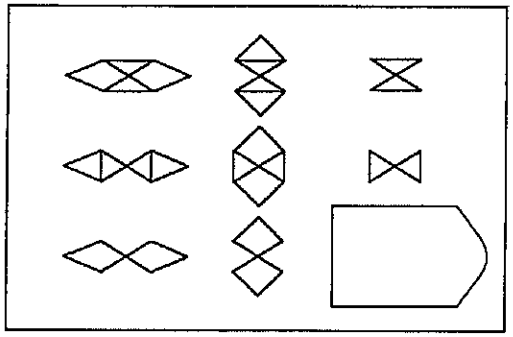
Please choose the image that best completes each of the following patterns.

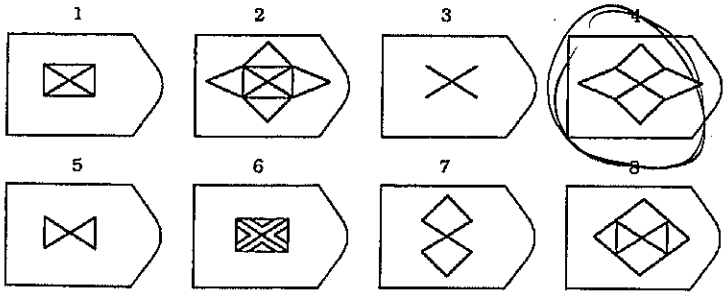
PATTERN 1





PATTERN 2





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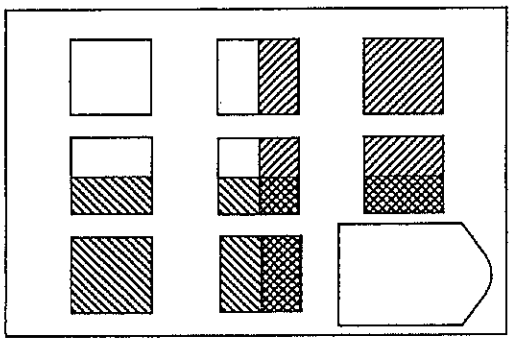
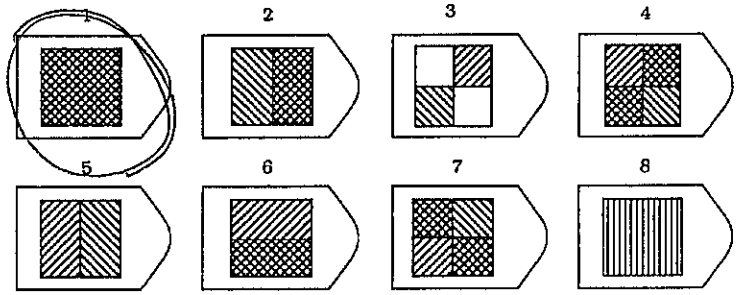
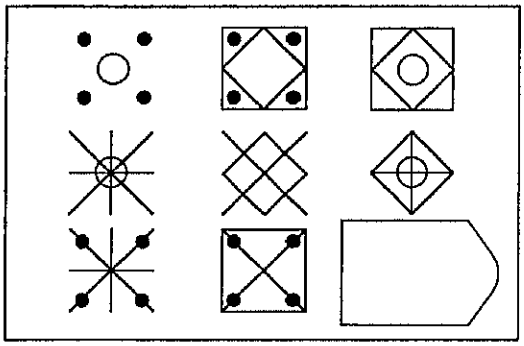
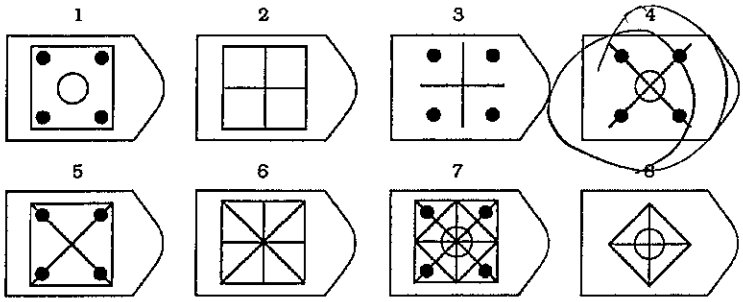
PATTERN 3





PATTERN 4





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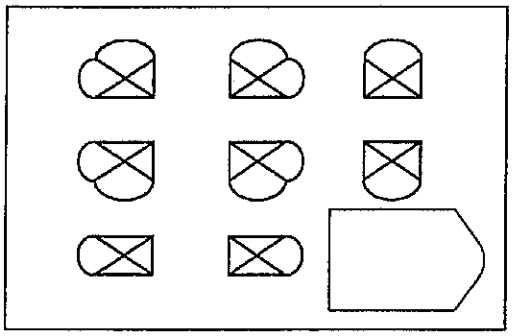
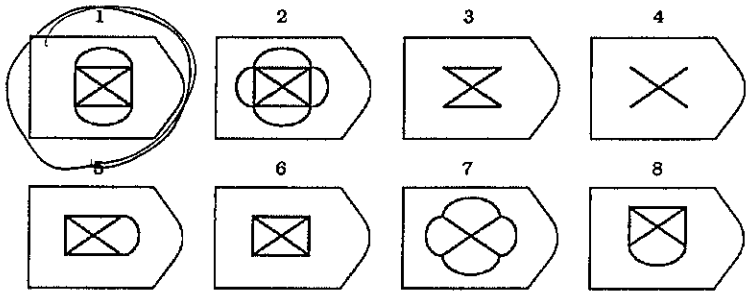
PATTERN 5





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Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

C. **1.** The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

(C.) When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

D. **2.** After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

(D.) Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

A. **3.** The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

(A.) The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

C. **4.** The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

(C.) The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

D. **5.** The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

(D.) The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

A. **1.** A balloon floating is like…

(A.) An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

A. **2.** Catching a cold is like…

(A.) Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48128

What is your gender?

___Male
✓ Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
✓ Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41850835 **GROUP:** 20
Version B

71

MULTIPLE-CHOICE. 5 points each (50 points total).

D 1. Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

But now! would create a blocking cloud, blocking solar energy from sun, lead to decreased temp. this is negative

C 2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
b. Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

C 3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

C 4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
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B 5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
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A 6. Which of the following would cause the acidity of Earth's oceans to decrease?
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B **7.** A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

D **8.** What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

A **9.** Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

B **10.** Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in atmospheric carbon dioxide would lead to more CO_2 in the oceans. With this increase in ocean CO_2, the ocean water's pH will increase. A pH increase signifies an increase in ocean acidification.

As I have just explained, this would be a positive feedback loop. A positive feedback continues a process without slowing down or stopping.

24

HOWEVER...

An increase in atmospheric CO_2 would lead to increase temperatures in addition more CO_2 in oceans. If temperatures increase, ocean water will be warmer. Molecules move faster in warmer water, and w/ faster molecules, CO_2 can not easily be admitted in ocean (it will kick it back out). That is why cooler waters hold more gases like CO_2.

This explaination illustrates a negative feedback. An increase in atmospheric CO_2, creates warmer oceans. Warmer water slows down the process of admitting CO_2 in the ocean - overall slowing down ocean acidification.

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

If there was an increase in volcanism on Earth, this would release more greenhouse gases in the atmosphere. With more greenhouse gases in the atmosphere, there could be a significant increase in temperture on Earth. This would come from the greenhouse gases absorbing and re-radiating solar energy - HEAT X

HOWEVER; if these volcanos erupt large ash clouds, there would be a block in the atmosphere by the ash clouds. This would shut out radiating energy from the sun. With this period of volcanism erupting large ash clouds, the Earth's temperture would decrease.

10

2 **Extra credit (2 points).**
How are evaporation and degassing similar and/or different?
Similar be both release gas into the atmosphere liquid
Different be degassing breaks to release gas from ~~and some other of~~

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

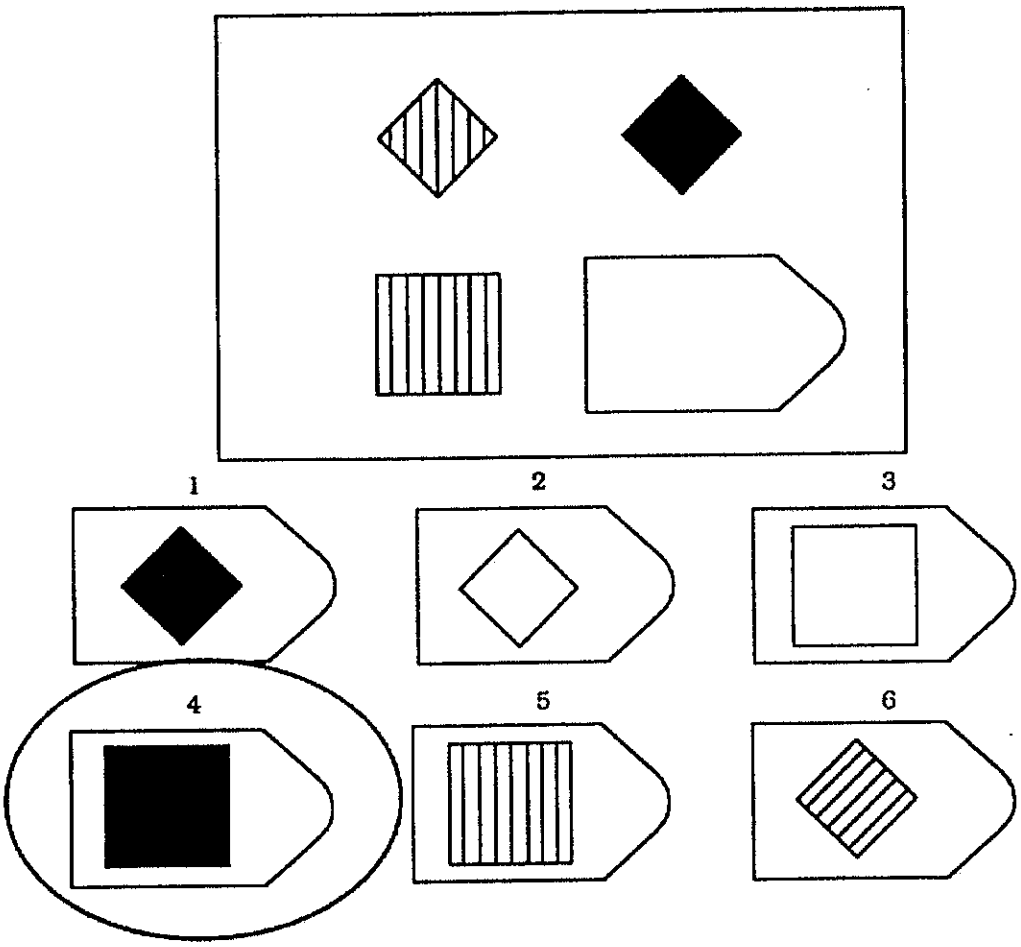
Thoughtfully complete the attached survey

Form B Test 1 A41850835 Student ID _____

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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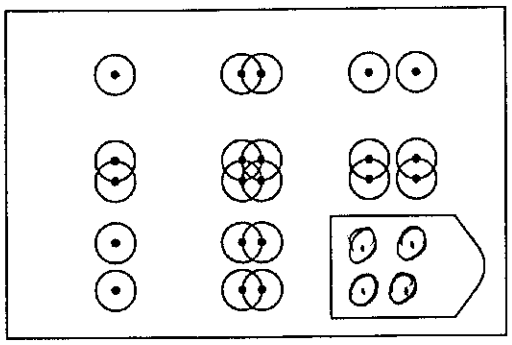
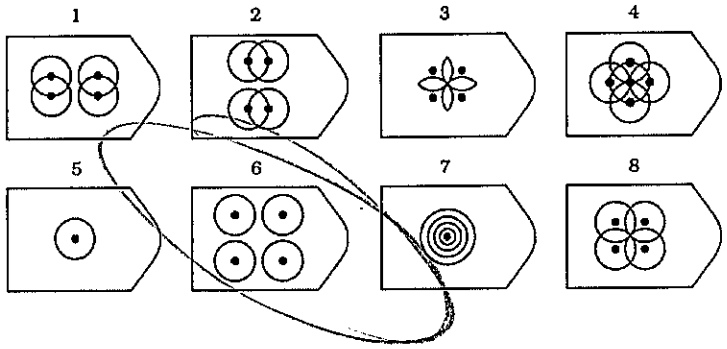
Form B Test 1 A4185035 Student ID _____

Please choose the image that best completes each of the following patterns.

PATTERN 1





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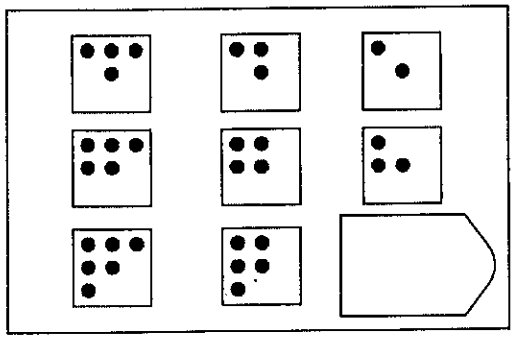

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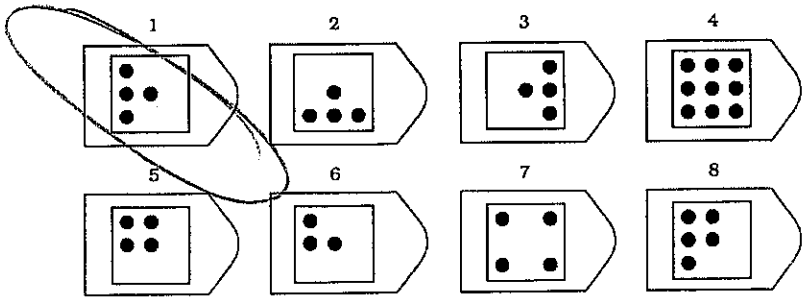

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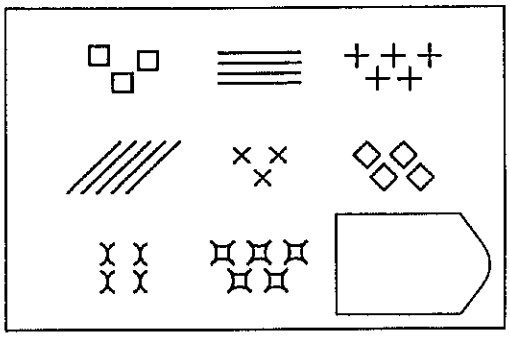
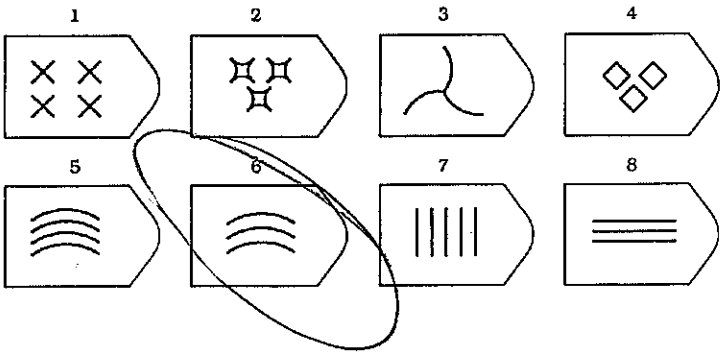
#41850835

PATTERN 3





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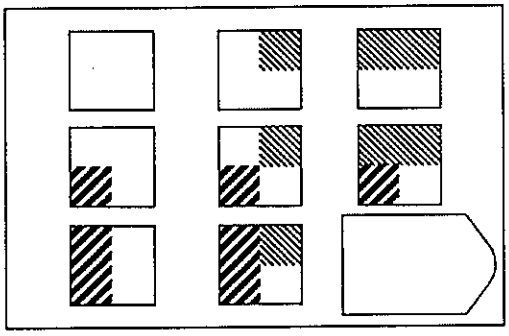
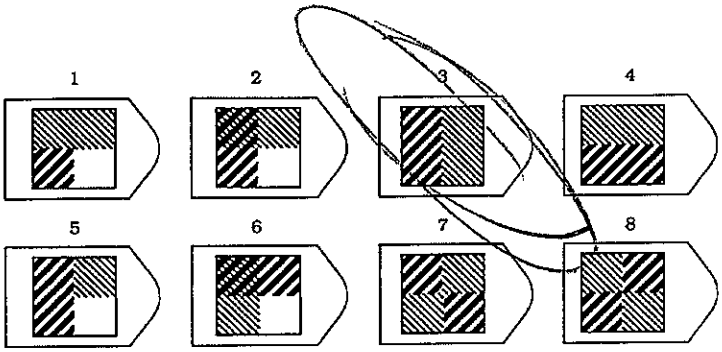
PATTERN 4





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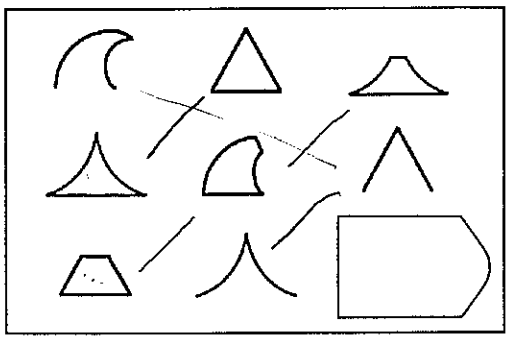
PATTERN 5



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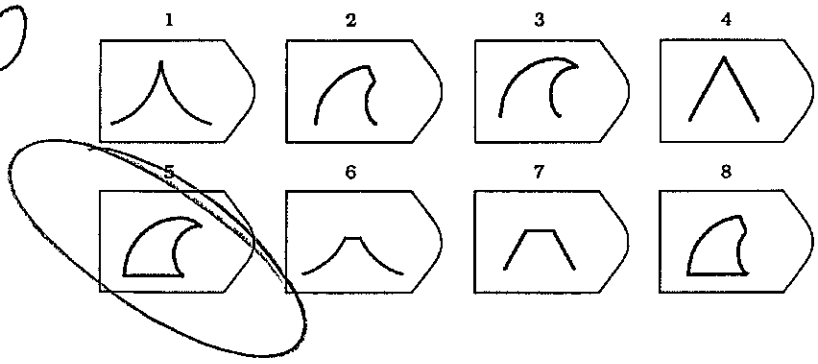


In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Form B Test 1 A41860835 Student ID _____

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

Form B Test 1 A4185508835 Student ID _____

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

A

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48015

What is your gender?

\ Male
✓ Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
___Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
\ Native American
✓ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43332855 **GROUP:** 20
Version A

53

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

2. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in the atmospheric carbon dioxide would increase ocean acidification. First CO_2 in the atmosphere is converted into CO_2 in the oceans. Then CO_2 and H_2O in the oceans combine to form calcium and hydrogen ions. These calcium and Hydrogen ions increase acidity by (creating more CO_2 through the process of weathering)? The positive feedback loop is that an increase in ocean acidification would still increase CO_2 in the atmosphere. The negative feedback loop is that more CO_2 in the oceans there is an increase in temperature in the atmosphere.

d?

10

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

An increase in volcanism would affect Earth's atmospheric temperature by increasing it. The greenhouse effect is when the sun sends solar radiation down to the earth. Then the earth absorbs the radiation and reflects visible light back into the atmosphere and the greenhouse gases. infared light to greenhouse gases convert the same infared light into heat and re-emit heat into earth's atmosphere, so if volcanism increased that would mean greenhouse gases would increase resulting in more heat converted and re-emitted into earth's atmosphere thus increasing earth's atmospheric temperature.

10

Extra credit (2 points):
How are evaporation and degassing similar and/or different?

They are similar because they require thermal energy.

Earn up to 1 additional point on your course grade

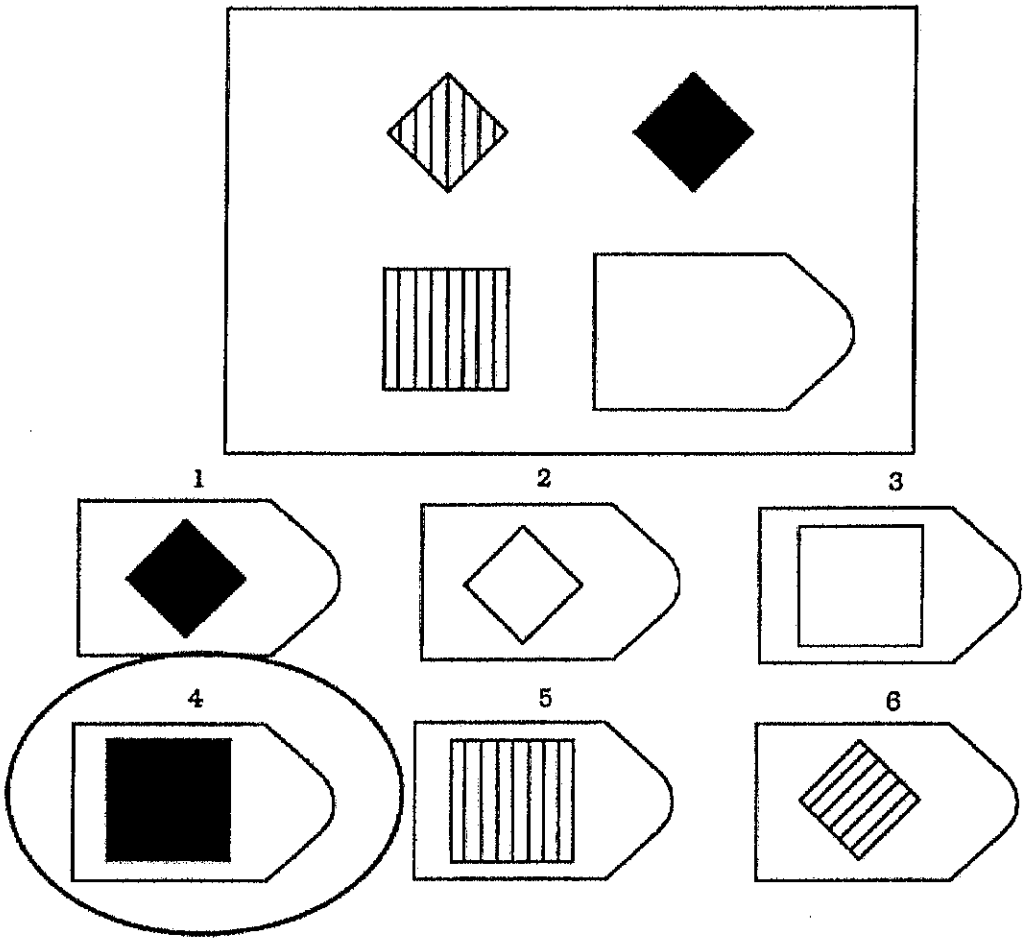
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form A Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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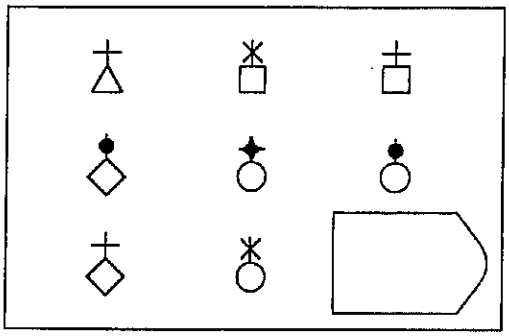

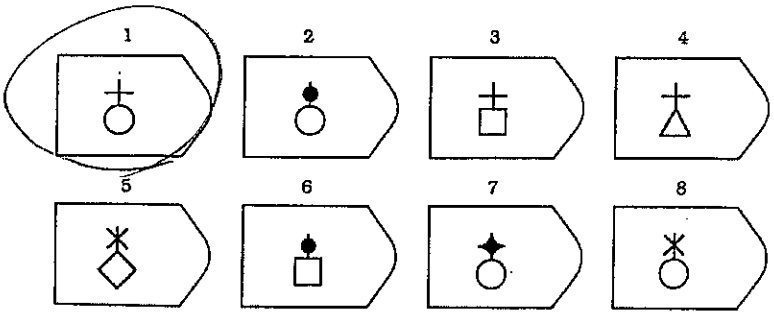

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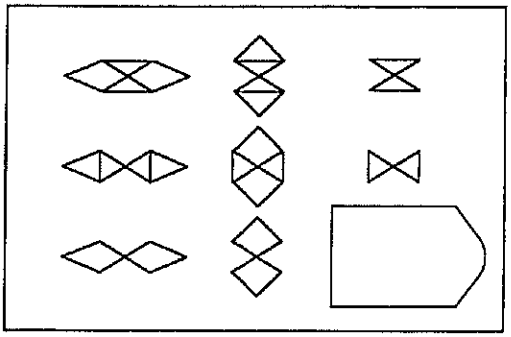

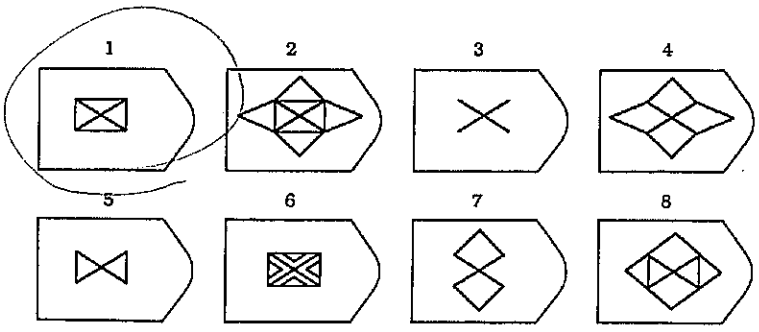

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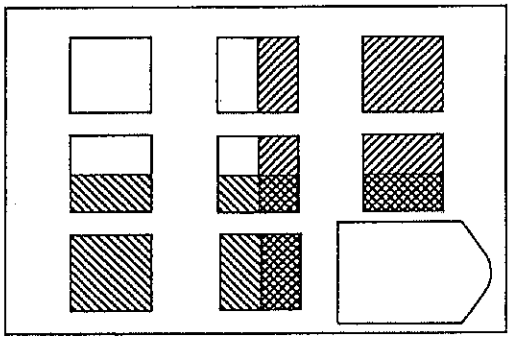

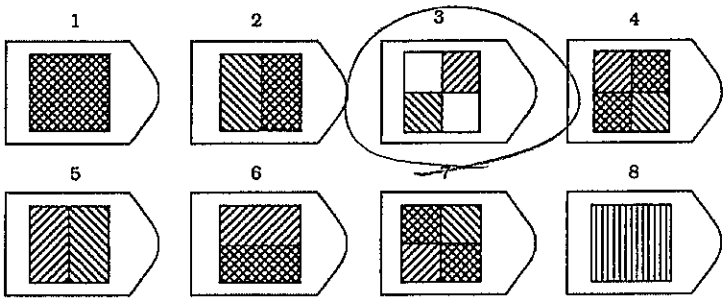

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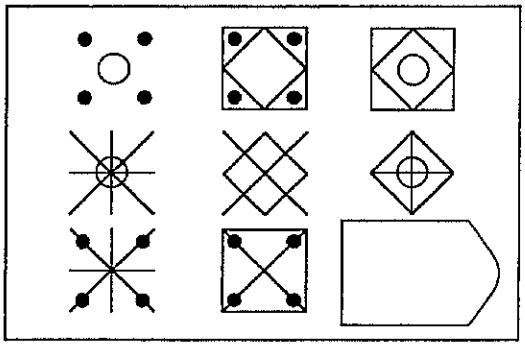

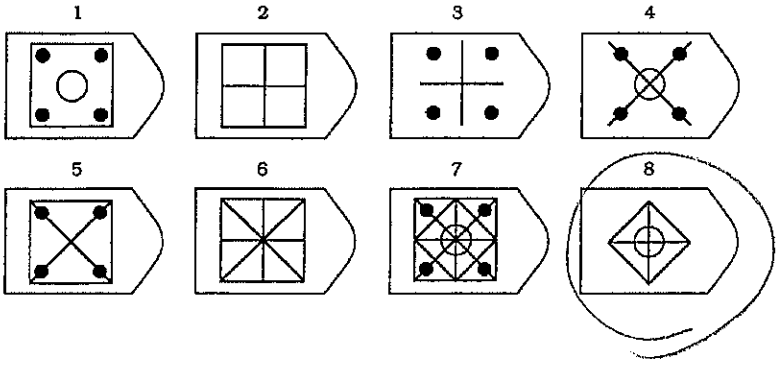

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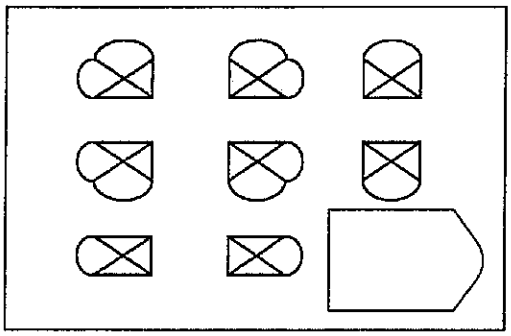
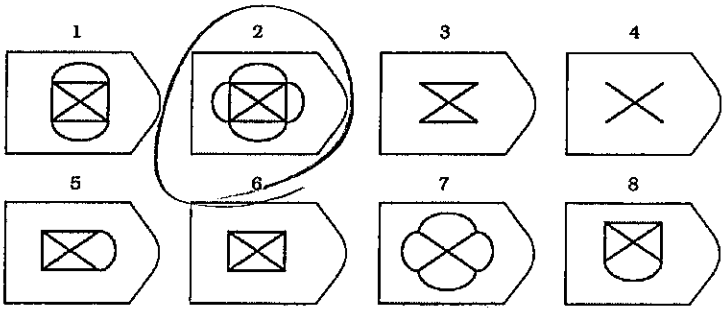
PATTERN 5





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Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 18 **years**

What is your home zip code? 48025

What is your gender?

√ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
√ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43535121 **GROUP:** 21
Version B

78

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
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5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
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   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

4435361 21

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

The increase in carbon dioxide in the atmosphere would cause the acidification in the ocean to increase until they reached equilibrium.

A. CO_2 in the atmosphere also becomes CO_2 in the Ocean to balance the equilibrium.

25

atmosphere
CO_2 CO_2 CO_2

Unbalanced = $\frac{CO_2\ CO_2}{CO_2}$ → $CO_2\ CO_2\ CO_2$ = balanced
$CO_2\ CO_2\ CO_2$

Ocean

B. Positive = the more CO_2 in the atmosphere equals more CO_2 in the ocean which makes the ocean more acidic

Negative = The increase of CO_2 in the atmosphere equals increased atmosphere temperature which increases Ocean temperature which decreases the amount of CO_2 the Oceans can hold which decreased the Ocean Acidification.

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The Temperature would decrease, because the ash would block out the suns' radiation.

A. The ash would block the suns radiation which would decrease the earths Temperature. It would also increase CO_2 which would increase "Green house Gases" which increase Temperature because they absorb heat and redistribute the heat in all directions

B. The Volconism would increase ash and CO_2, but since the Suns radiation doesn't penetrate the ash. The CO_2 has nothing to absorb to then warm the Earth.+?

Pg. 18

Extra credit (2 points).
How are evaporation and degassing similar and/or different? They both release gas into the atmosphere, but evaporation happens because of thermal energy. Degassing happens to reach equilibrium

Earn up to 1 additional point on your course grade

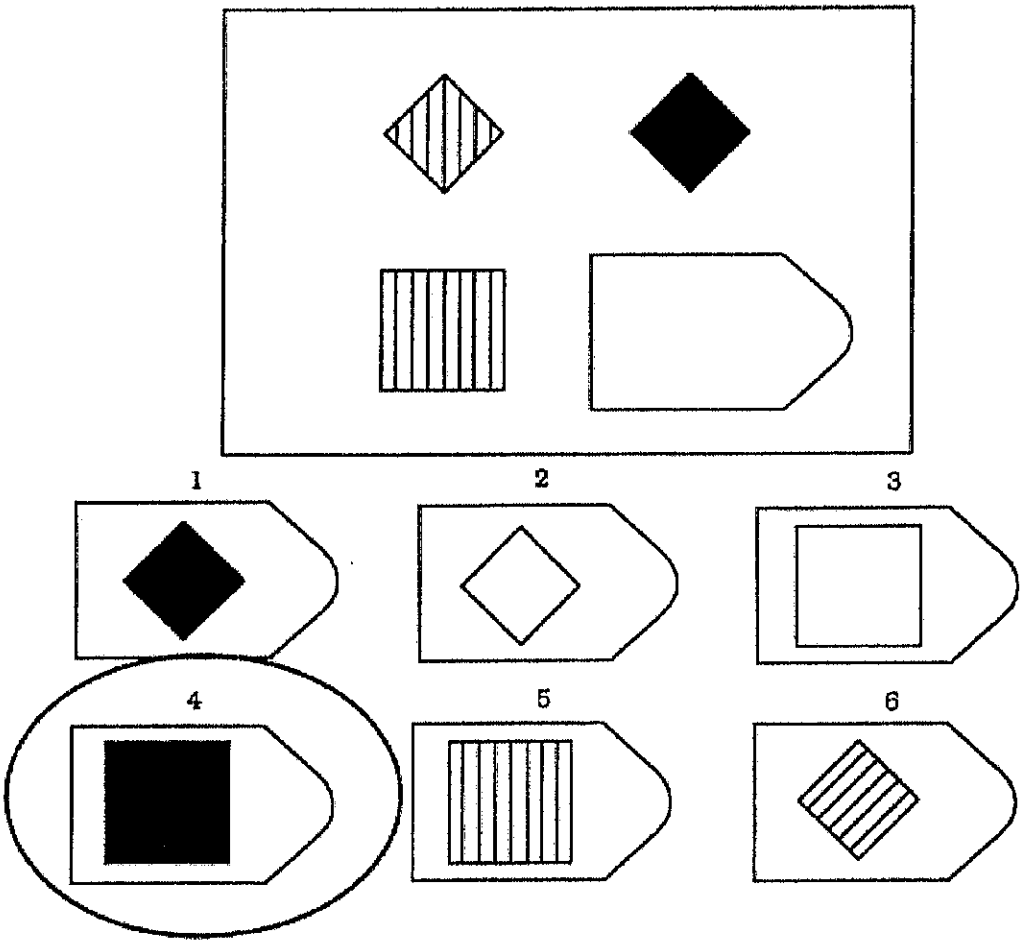
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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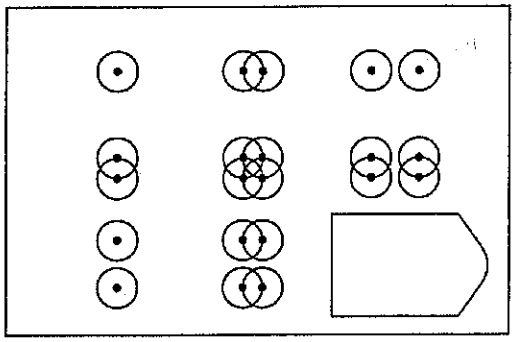
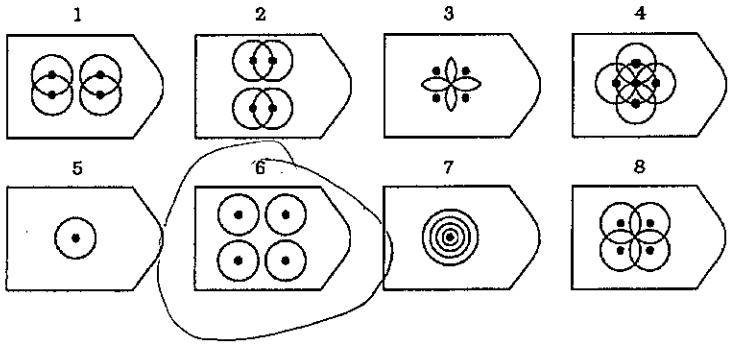
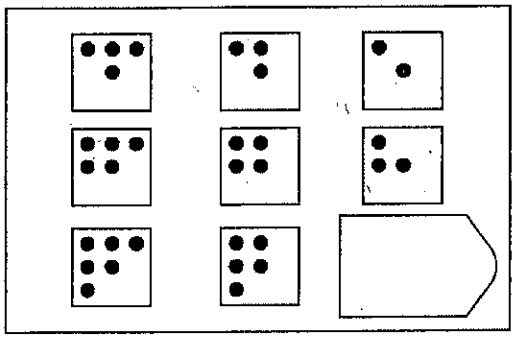
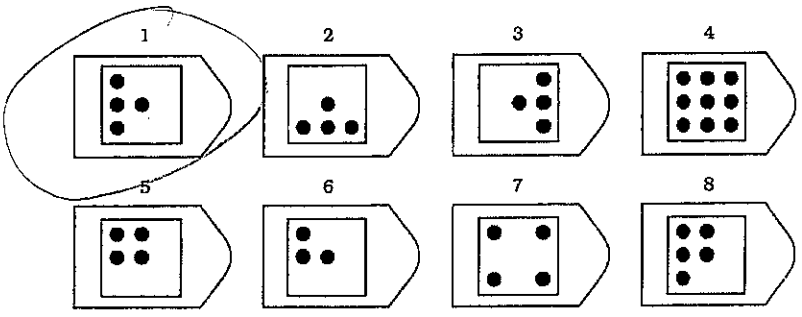




PATTERN 2





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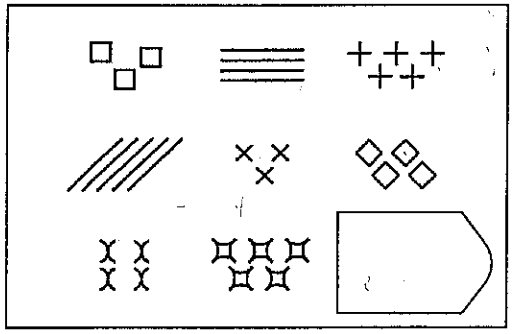
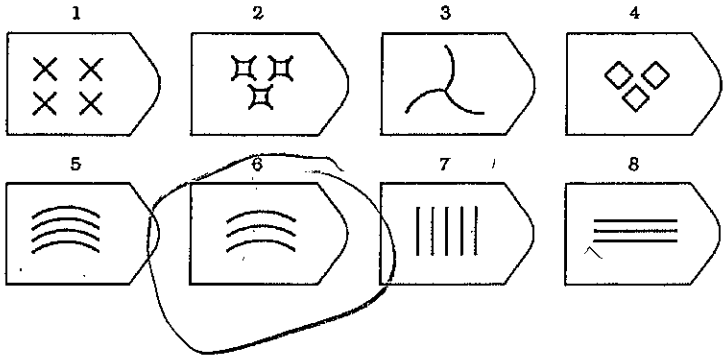
PATTERN 3





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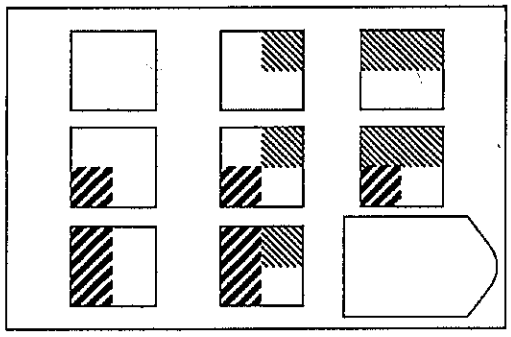

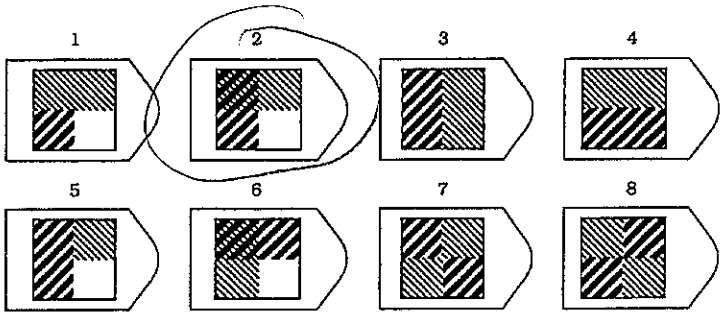

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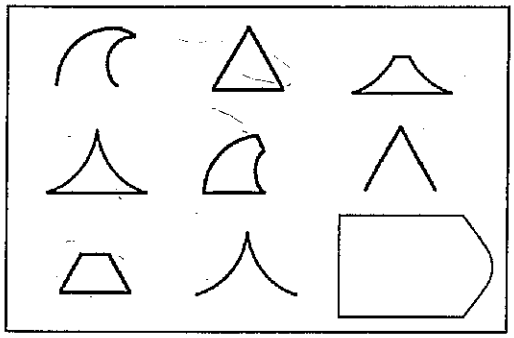
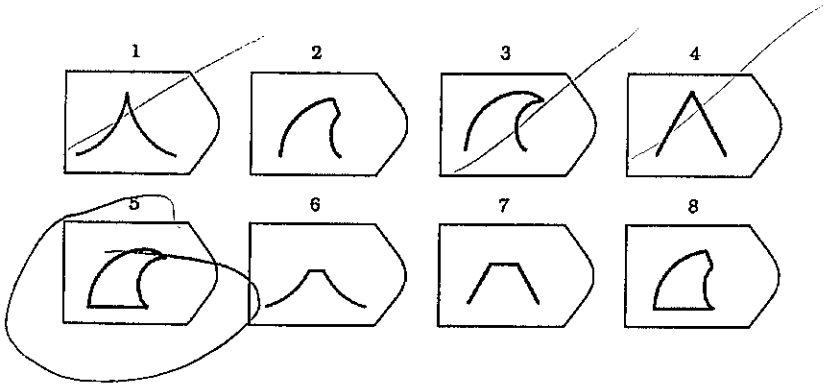
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 27 **years**

What is your home zip code? 48906

What is your gender?
X Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.
___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

perfect

STUDENT NAME: A42271052 **GROUP:** 21

Version B

11 102

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere positive
d. c. An increase in evaporation and cloud formation resulting in the release of latent heat
   (d.) An increase in desert formation resulting in more dusting blowing into the atmosphere
   temperature ↑ temperature ↓

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
b. (b.) Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium (Ca) atoms in a limestone at Earth's surface become calcium (Ca^{2+}) atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
C. b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   (c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   (b.) Natural processes are the primary cause of the greenhouse effect.
b. c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
b. (b.) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

$T = V/q$ (V) $B=5$ $A=10$ $(q)=2$

A(a) | $T_A = 10/2 = 5$ | $T_B = 5/2 = 2.5$

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   (a.) An increase in ocean temperature due to an increase in atmospheric carbon dioxide. eventually
a. b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

Temperature inversely related to CO_2 containment

✓

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
b. (b.) The reservoir is not in equilibrium. inflow ≠ outflow $T = V/q$ influx > outflow, therefore ↑T
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years. $V = 1000 km^3$ $q = 100 km/year$ v $50 km/year$

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates? higher than natural rate ↑CO_2 concentrations
   a. The Earth's atmosphere would become colder than it is today.
b. (b.) The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   (a.) Reflection of more solar radiation, causing atmospheric temperature to decrease
a. b. Reflection of more solar radiation, causing atmospheric temperature to ~~increase~~
   c. ~~Re-emitting~~ of more infrared radiation, causing atmospheric temperature to increase
   d. ~~Re-emitting~~ of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. ~~Less energy will~~ be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. (b.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature. latent heat
   c. ~~Less energy~~ will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

Cloud formation reflects solar radiation.

ID: A14271052

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

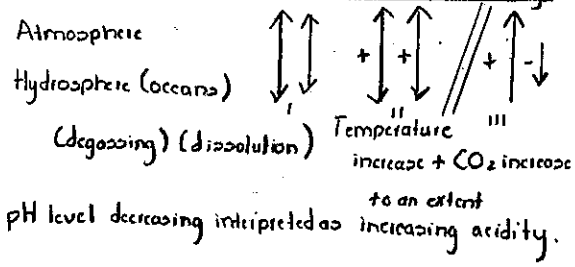
a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

$CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

CO_2	Carbon dioxide gas
H_2O	Liquid (ocean) water
HCO_3^-	Carbonic acid
H^+	Hydrogen ion; increase acidity.

Involved reservoirs CO_2 concentration/exchange



* pH level decreasing interpreted as increasing acidity.

Ocean acidification is a natural process which results from the exchange of carbon dioxide gas between the ocean and atmosphere.

An increased concentration of atmospheric carbon dioxide directly corresponds to an aggregate increase in atmospheric temperature. The ocean naturally contains dissolved carbon dioxide gas (represented by presented equation) in an equilibrium exchange. Increased quantities of dissolved carbon dioxide result in the presence of more carbonic acid and hydrogen ions (HCO_3^-; H^+), essentially, decreasing the pH level of ocean water. Reports concerning ocean acidification have discovered the overall pH level of Earth's oceans to have decreased from 8.25 to 8.13 since the mid-eighteenth century. However, negative feedback is associated with oceanic carbon containment and increased levels of carbon dioxide. An increase in aggregate atmospheric temperature in addition increases global water temperature. Warmer ocean water is less efficient at containing dissolved gases, and therefore, more carbon dioxide must be contained in the atmosphere as another reservoir (biosphere, sequestration, lithosphere). The final supposed result is negatively correlated to oceanic containment, and positively correlated to increasing global temperature

25

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

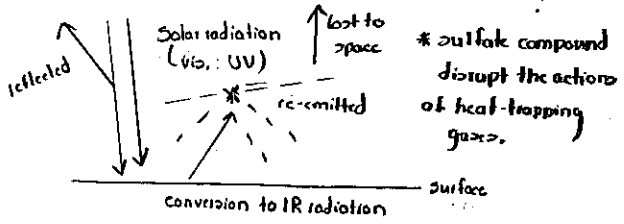
Involved reservoirs (temperature/composition

Lithosphere (volcanism)

Atmosphere

Heat-trapping gases (water vapor, carbon dioxide, methane, etc)

Absorb infrared (IR) radiation emitted from the Earth's surface and re-emit the energy in all directions.



Scientific explanation:

A significant increase in volcanism (Earth's volcanic activity) may ~~potentially~~ have a variety of effects on Earth's natural systems. Foremost, the "greenhouse effect," which is responsible for containing heat in Earth's lower atmosphere utilizing heat-trapping gases (water vapor, carbon dioxide, methane) would be adversely affected. Volcanic ash contain large amounts of sulfur, in particular sulfur aerosols. The sulfur aerosols when dispersed throughout Earth's upper atmosphere have the tendency to "block" or reflect incoming solar radiation, working in direct opposition to heat-trapping gases. The understood outcome of an increase in atmospheric sulfur compound is therefore a relatively short period of atmospheric (troposphere) cooling. Earth's atmospheric temperature would steadily decline over the period of significant volcanism.

Historical explanation:

Historical events tend to support the scientific explanation of significant volcanic activity corresponding to cooler temperatures. Historical records include periods of below average temperatures referred to as "Little Ice Ages" during periods of intense volcanism.

25

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

2

Evaporation and degassing are both means of transporting matter in a gaseous state. However, evaporation is a phase change (ie. liquid to gas) while degassing simply involves the release of a gas.

Earn up to 1 additional point on your course grade

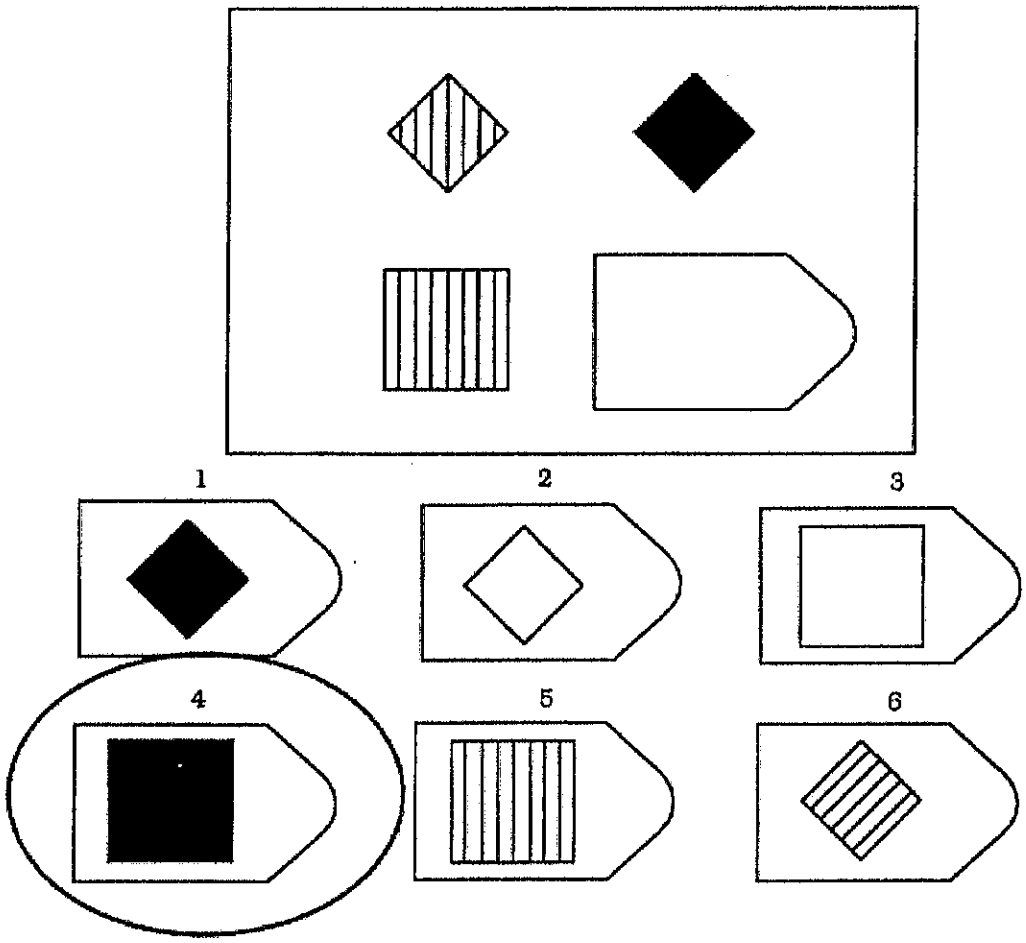
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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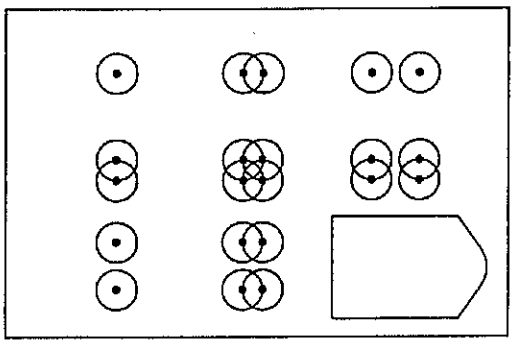
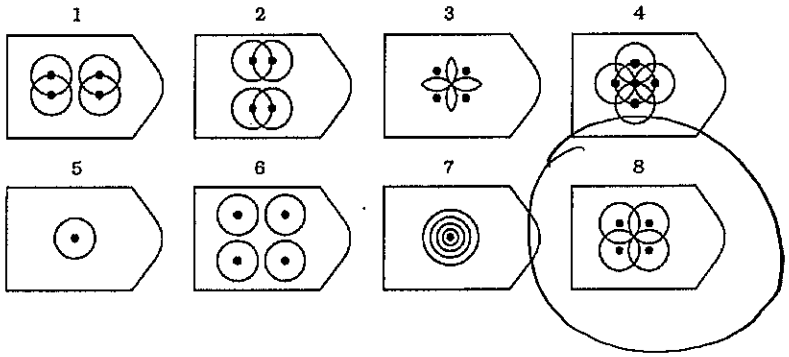
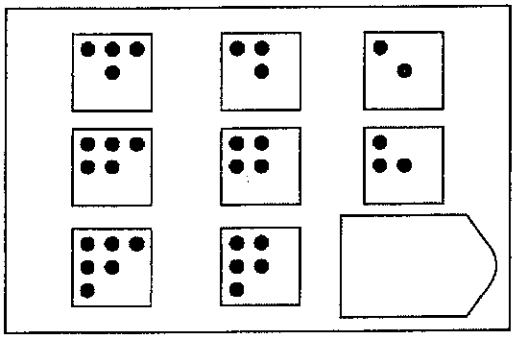
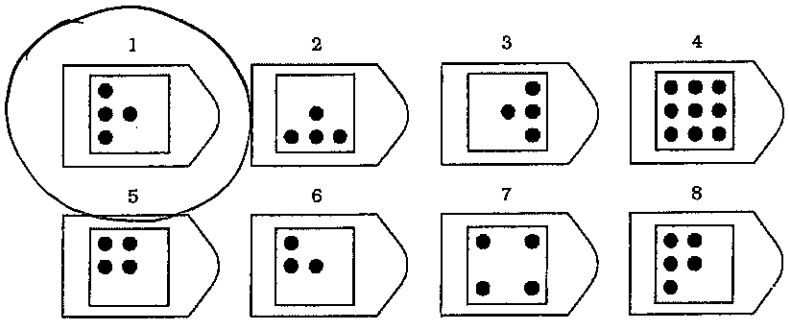




PATTERN 2





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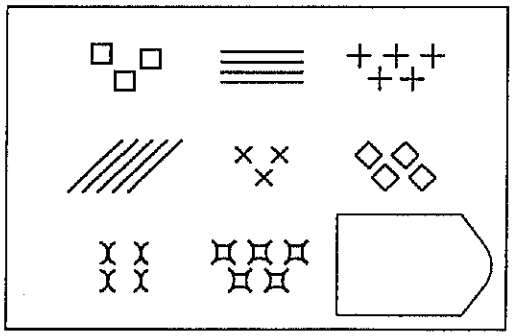
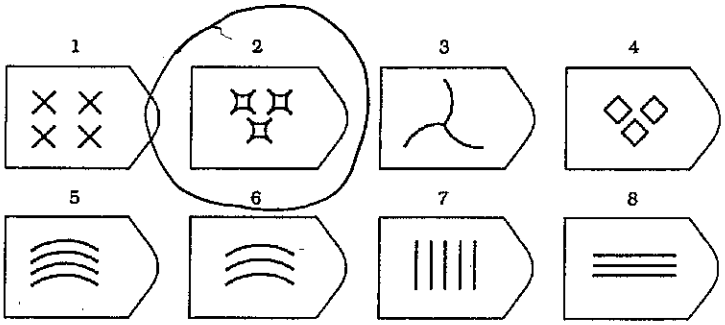
PATTERN 3





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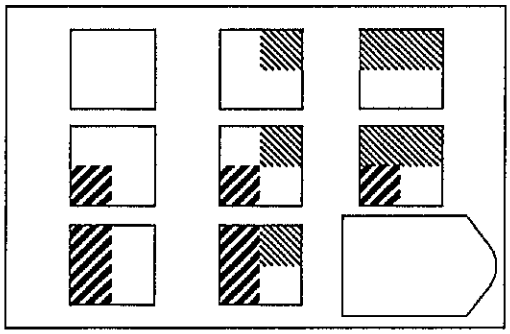

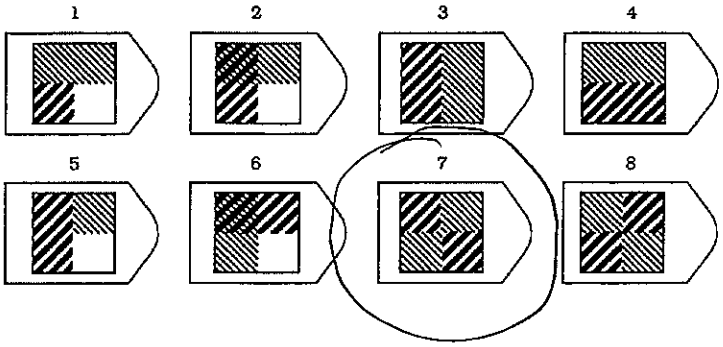

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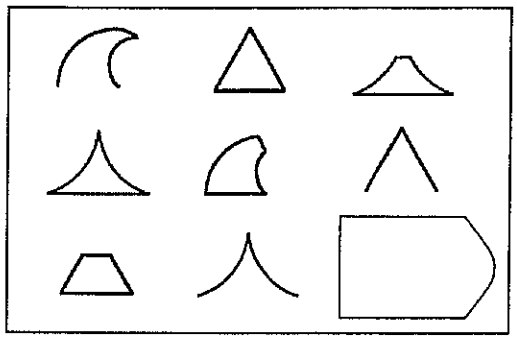
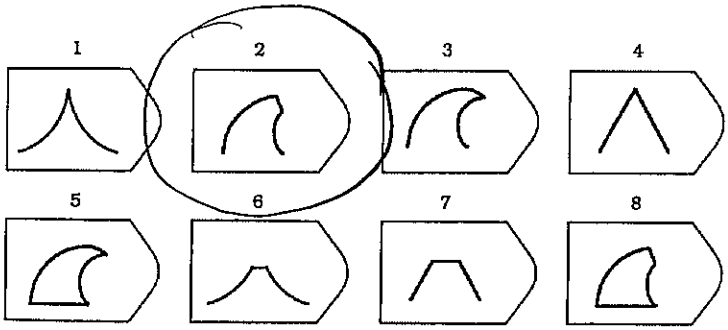
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
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C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

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A. While debugging their broken firewall, a programmer came across top-secret CIA files.

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D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

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C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

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C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

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A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

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A. Getting high. They are both involve too much of a chemical influencing the body.

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C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

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A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48309

What is your gender?

_/_ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
_/_ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42134271 **GROUP:** 21
Version B

53

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

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   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

H_2O

An Increase in Atmospheric CO_2 would increase ocean acidification. CO_2 in the atmosphere goes to the hydrosphere which then becomes CO_3 and as it bonds with the water molecules it becomes calcium ? and H^+ in the oceans.

18

The positive feedback loop is that there is CO_2 in the atmosphere causing PO_2 in the oceans, both increasing Temperature

The negative feedback is the increase in temperature causing more clouds to form, which causes more humidity, and rain.

?

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

An increase in volcanism would cause large ash clouds that would block most solar radiation from reaching the earths surface. This would cause a decrease in earths temperature. With less visible light passing through to the earth, the greenhouse effect would decrease, with atmospheric temperature decreasing, because less infrared light will be reflected back to the Atmosphere due to the Ash cloud blockage. There would also reduce greenhouse gasses. ?

?

15

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Earn up to 1 additional point on your course grade

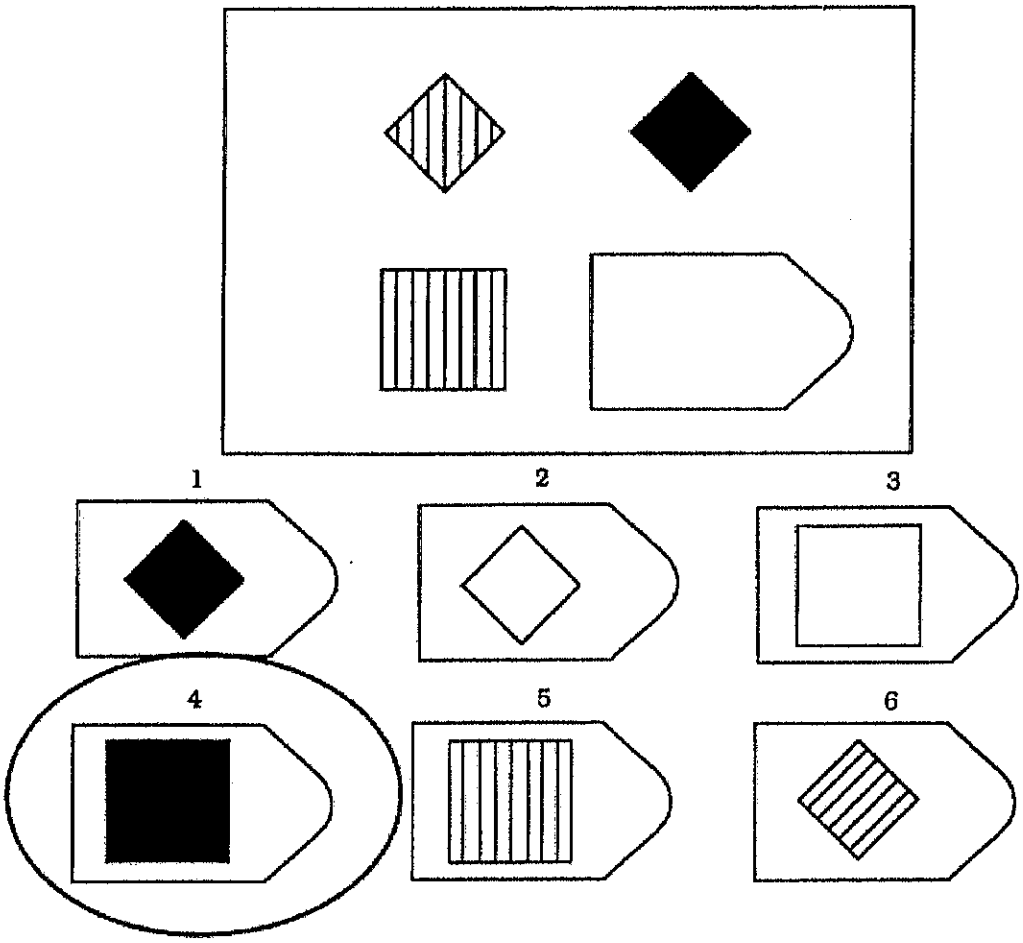
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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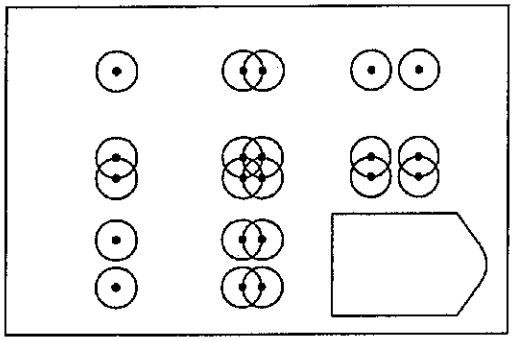
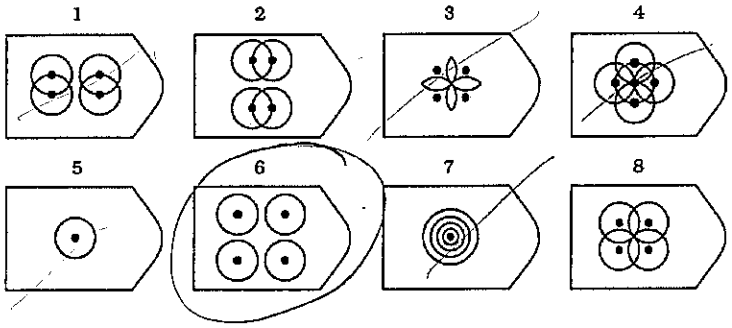
A42134071

Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

PATTERN 1





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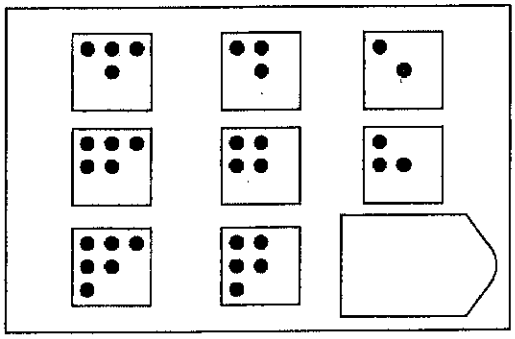

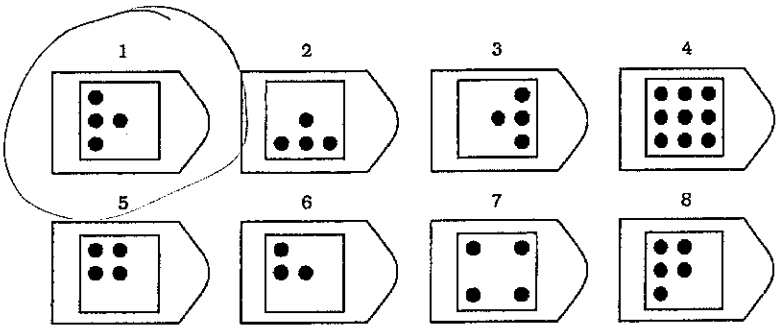

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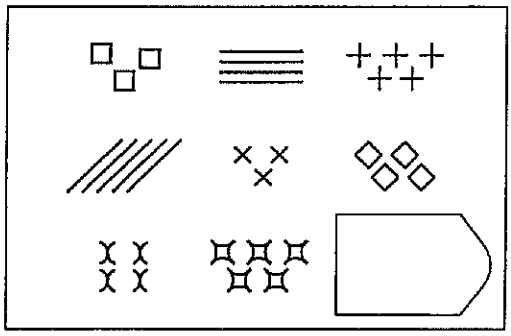
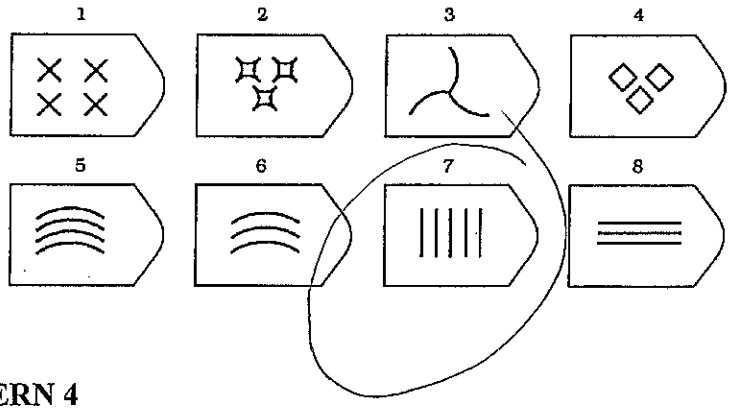
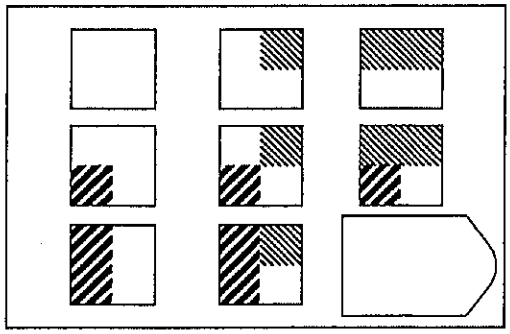
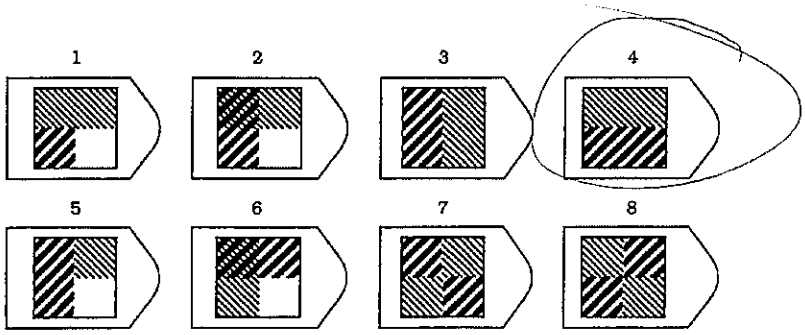
PATTERN 3





PATTERN 4





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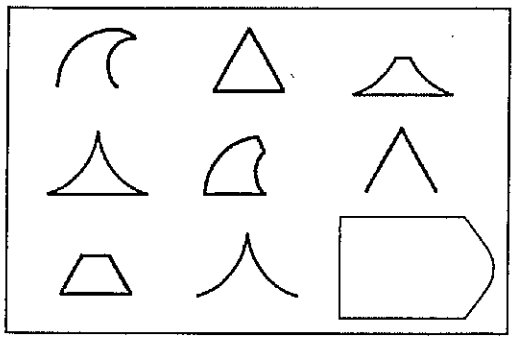
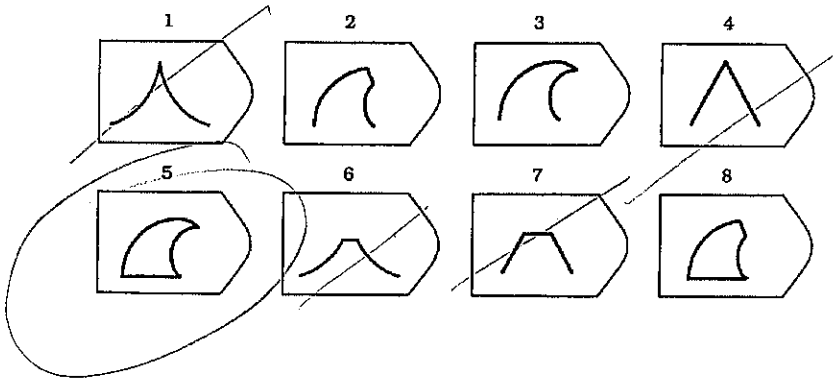
PATTERN 5





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PLEASE CONTINUE ON NEXT PAGE

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2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

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DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48444

What is your gender?

___Male

Female

___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black

___Caucasian

Latino/Hispanic

___Native Hawaiian/Pacific Islander

___Native American

___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A36628634 **GROUP:** 21
Version B

21

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

A

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

D

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

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   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

C

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
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   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
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5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
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6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
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8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
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9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
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   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
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10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
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SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

carbon dioxide + water (=> Hydrogen

An increase in the atmospheric CO_2 affects the ocean acidification in a positive way because more CO_2 is add into the ocean. The energy caused by the sun enters molecules which is absorbed into the ocean. These molecules rise up and the solar radation is emitted by the ocean. The atmosphere increase carbon dioxide and the ocean. it allows more carbon dioxide into the ocean. the more CO_2 enters the more CO_2 becomes a solid and form an equilibrium the less CO_2 you have slower it takes to go into the ocean it would be negative.

they also dissolve

5

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The volcanism on Earth would increase the temperature by energy being released causing the molecules to rise the the temperature have increased due the surface getting hotter causing magma chambers to form which explains why the rise causing the increase to the surface. Heat push molecules up causing the cooler air to sink into the atmosphere. (The green house effect is caused by radiation molecules which absorbs heat because of emitted radiation from the sun.)

? This an example of Bouyancy + dense?

1

?

Extra credit (2 points).
How are evaporation and degassing similar and/or different?
evaporation and degassing are similar because they both deals with releasing gas involves; both deals with absorbing and releasing

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

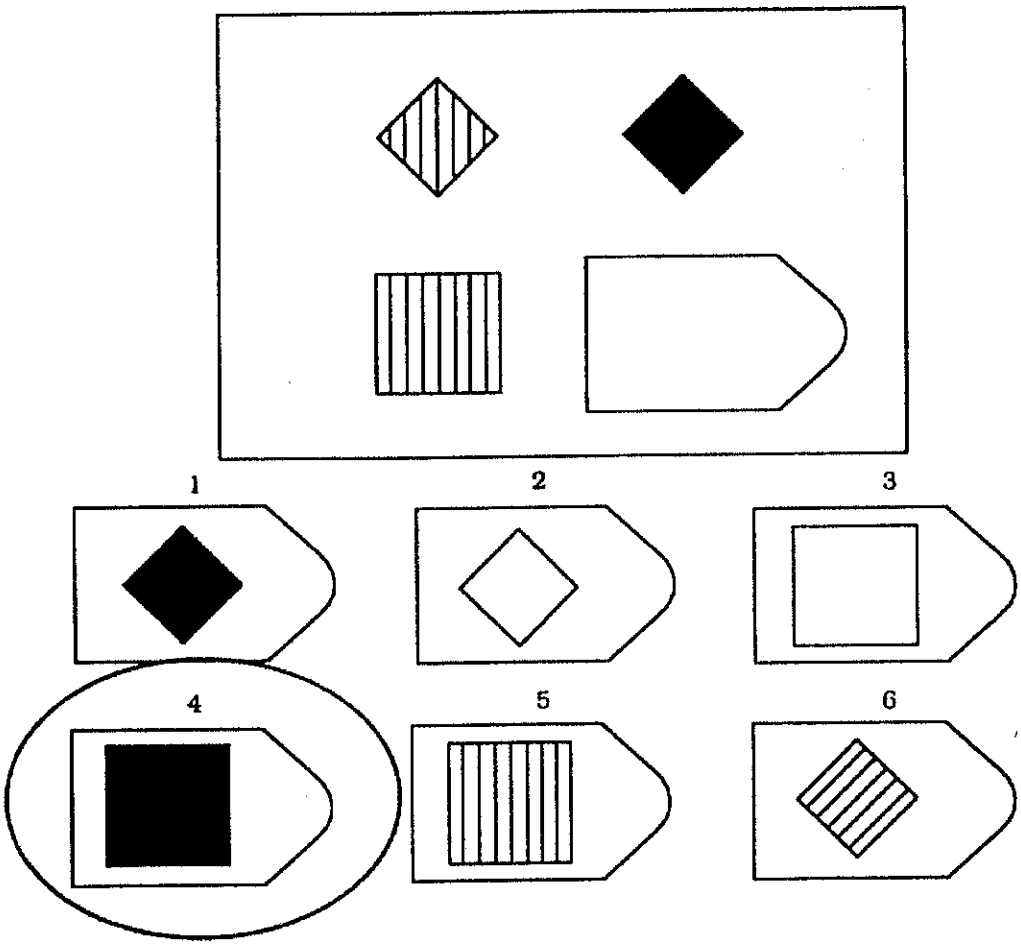
A36658634

Form B Test 1 Student ID _____

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

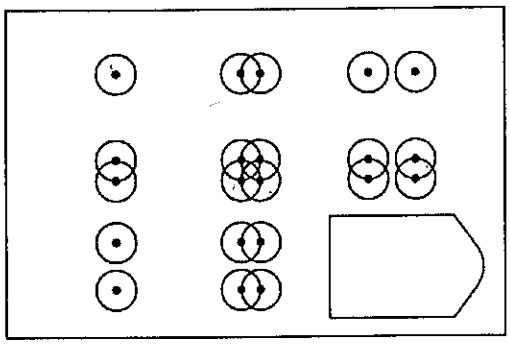
PLEASE CONTINUE ON NEXT PAGE

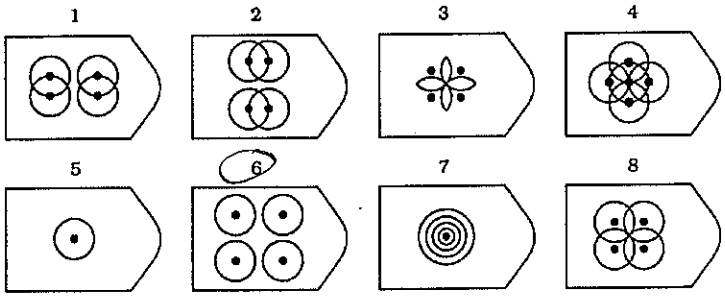
A36628634

Form B Test 1 Student ID _____

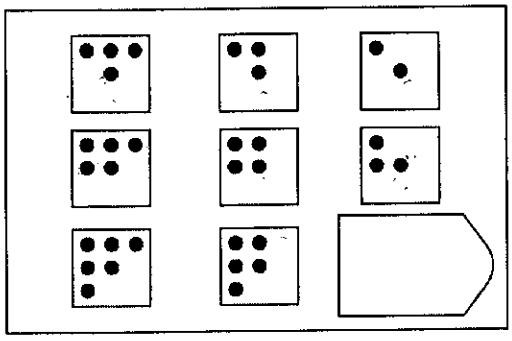
Please choose the image that best completes each of the following patterns.

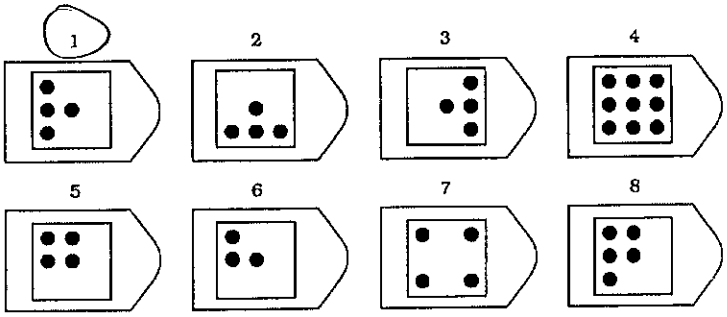
PATTERN 1





PATTERN 2





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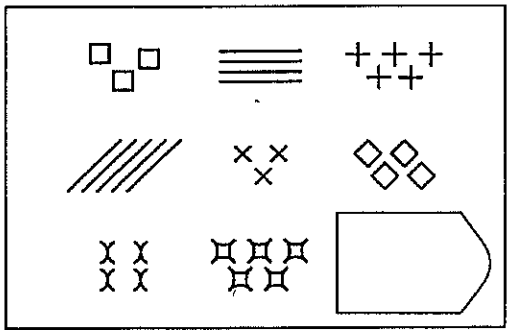
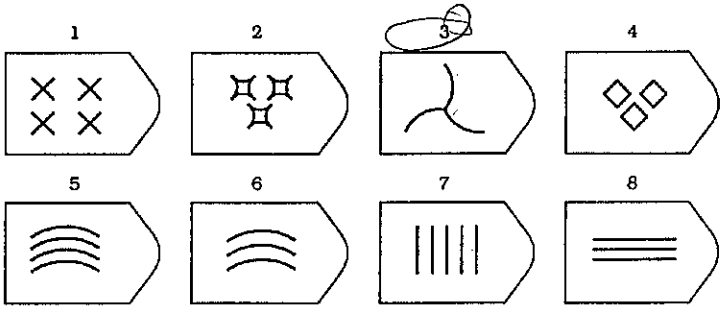
PATTERN 3





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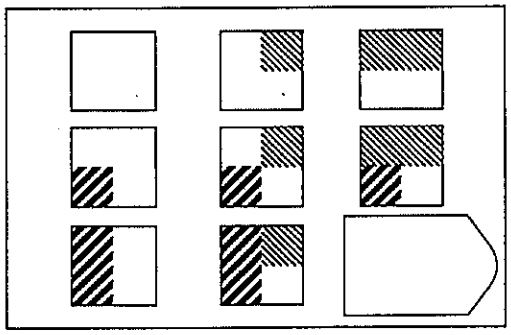

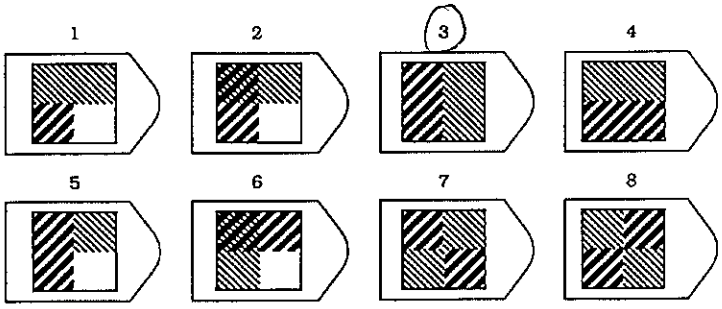

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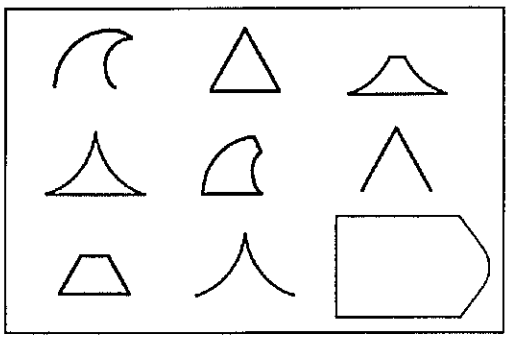
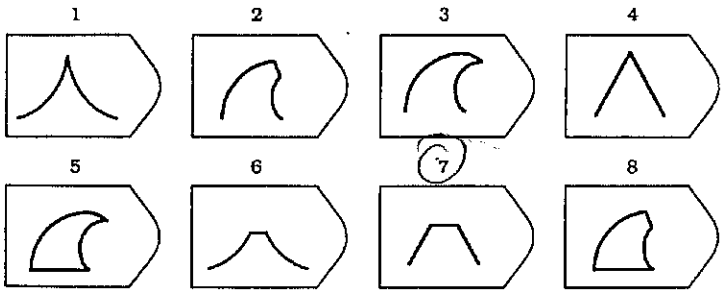
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Form B A36084434 Test 1 Student ID _____

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 24 **years**

What is your home zip code? 48505

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

X African American/Black
___Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42052431 **GROUP:** 21
Version B

88

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   (d.) An increase in desert formation resulting in more dusting blowing into the atmosphere

D

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   ~~a. The magma becoming colder~~
   (b.) Gas bubbles forming in the magma
   ~~c. The surrounding crust becoming hotter~~
   ~~d. Crystals forming in the magma~~

B

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of ____C____.

   ~~a. A= erosion, B= deposition, C= uplift and erosion~~
   ~~b. A = erosion, B= biochemical precipitation, C= uplift and deposition~~
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

D

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   (b.) Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

B

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   (b.) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

B

residence = capacity / flow
10 B / 5 = 2
20 A / 5 = 4

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   (a.) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

A

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
B (b.) The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
D b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
* (d.) The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
A (a.) Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

break bonds = use energy form bonds = release

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
B (b.) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

*8. Even if we reduce greenhouse gas emissions to 1990 rates, there will be several factors involving positive & negative feedbacks that make it hard to say exactly what would happen to Earth's atmospheric temperature. But it would make sense that, over time, less greenhouse gas emissions would cause Earth's atmosphere to become gradually cooler.

(continued from bottom) and warmer. But more oceanic CO_2 → more atmospheric CO_2 → warmer atmosphere & oceans → less CO_2 absorbed in oceans → less oceanic CO_2 = negative feedback loop.

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

A42052431 Campbell, Colleen

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

25

An increase in atmospheric carbon dioxide would increase ocean acidification. CO_2 is passed freely from the atmosphere to the oceans. So if we have more CO_2 in the atmosphere it means that we will also have more CO_2 in the oceans. Cold water is more efficient at absorbing CO_2, and warm water is more efficient at releasing CO_2. With more CO_2 in the atmosphere, because of the greenhouse effect the atmosphere would become warmer, therefore making the oceans warmer. Because the oceans are warmer, less CO_2 is being absorbed into the oceans, but the CO_2 that is in the oceans is being released back into the atmosphere at a faster rate. This increased presence of CO_2 will cause the atmosphere to get even warmer, making the oceans even warmer, etc... this is a positive feedback loop because the atmosphere and oceans will become continually warmer (top)

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature? Colder

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

23

A sudden increase of volcanism on Earth would cause large amounts of ash to be released into the atmosphere. Because of all this ash, less solar radiation will reach Earth's surface because the ash will reflect a lot of that solar radiation back in to space. With the greenhouse effect, solar radiation reaches Earth's surface where it is absorbed then re-emitted back into the atmosphere as infrared energy. The greenhouse gases in the atmosphere trap? much of this infrared energy, causing the Earth to remain relatively warm, even after the sun has set. But if we have large amounts of ash in the atmosphere because of volcanic eruptions, then less solar radiation will ever reach Earth's surface because the ash will reflect much of it back in to space. With less solar radiation we will have less energy absorbed by Earth, and less infrared energy being re-emitted in to the atmosphere. More ash will make the greenhouse →

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

A42052431
Campbell, Colleen

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

ffect less strong because of lower amounts of solar radiation being able to reach Earth in the irst place. Therefore, more ash in the atmosphere ill cause the Earth to become cooler as he greenhouse effect is lessened.

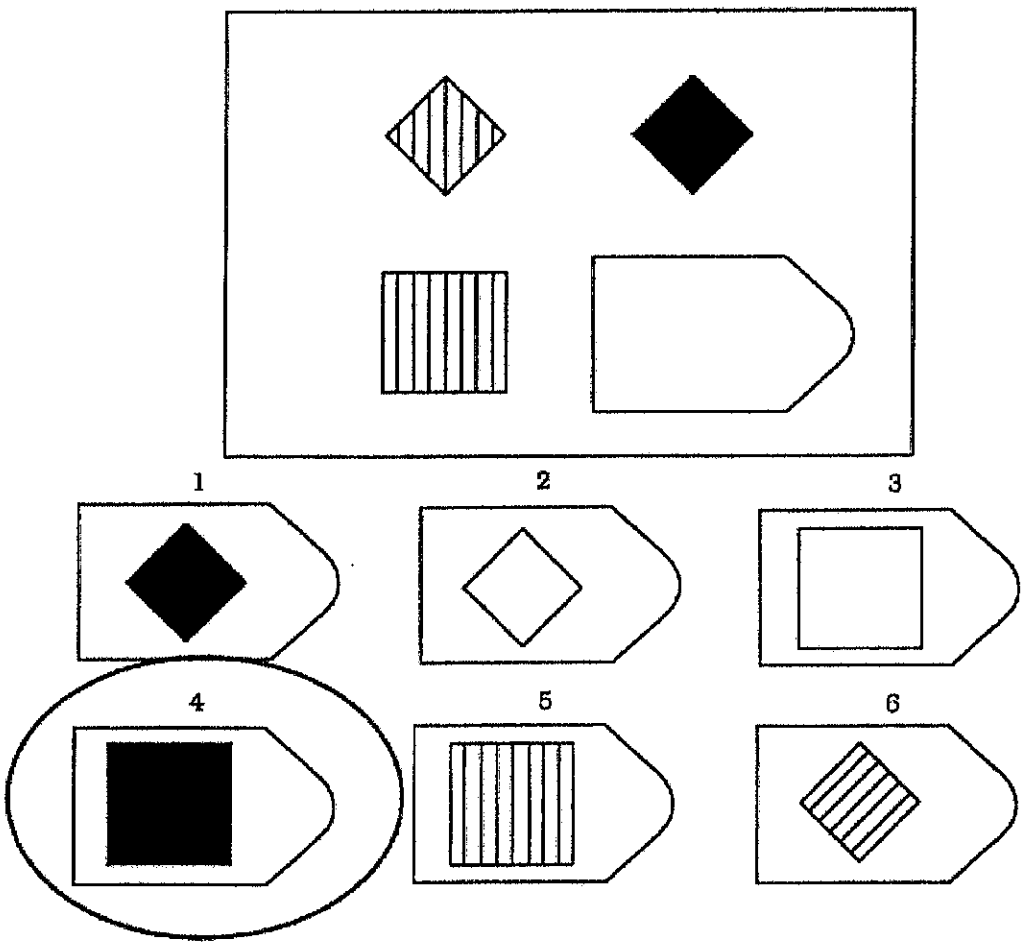
Form B Test 1 Student ID AA20524311

Campbell

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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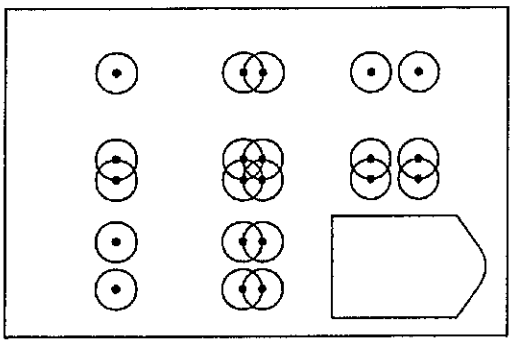
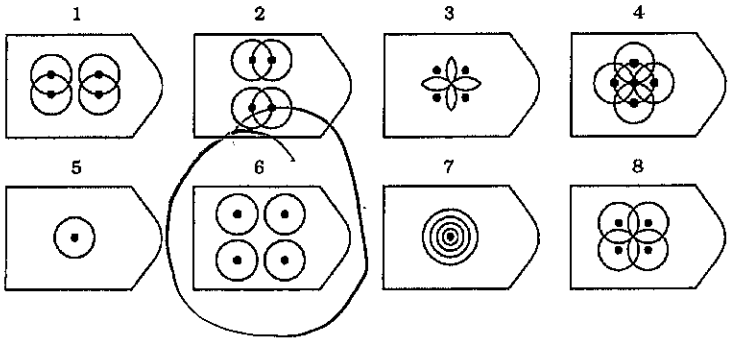
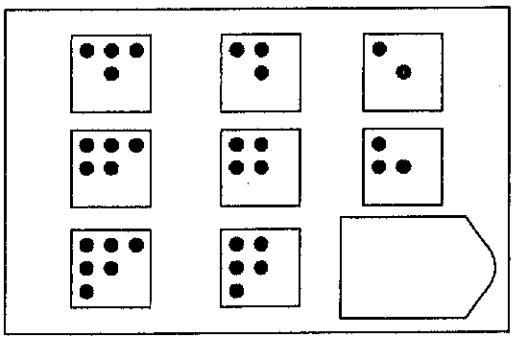
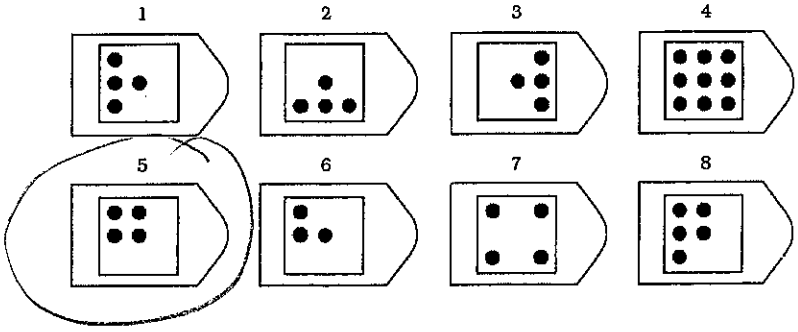




PATTERN 2





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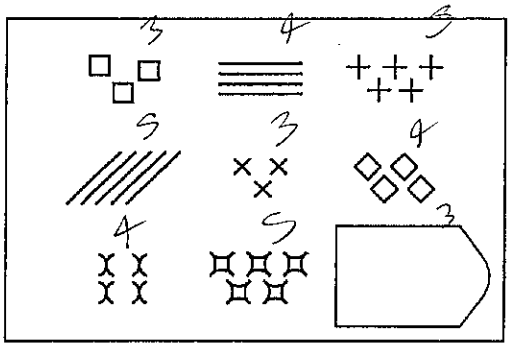
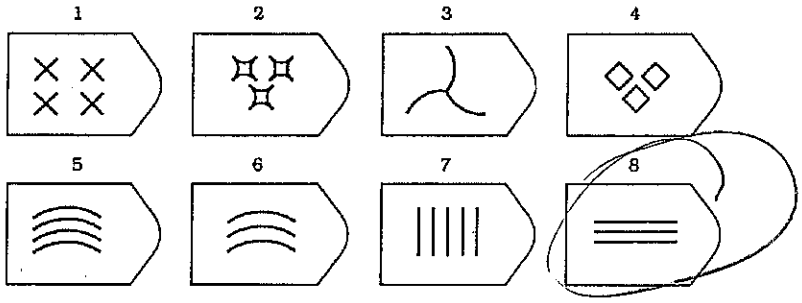
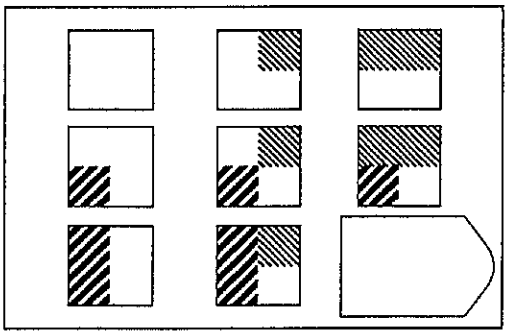
A4205243 1
Student ID
Campbell

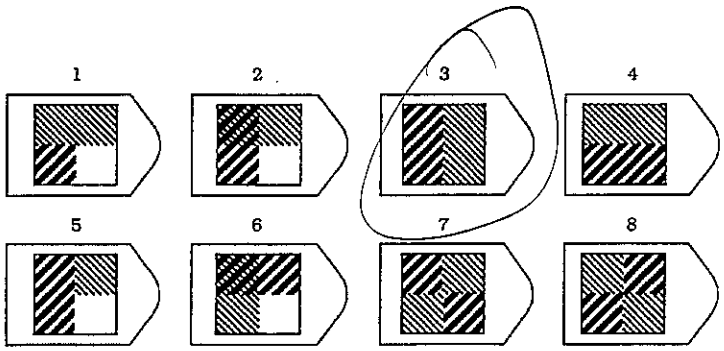
PATTERN 3





PATTERN 4





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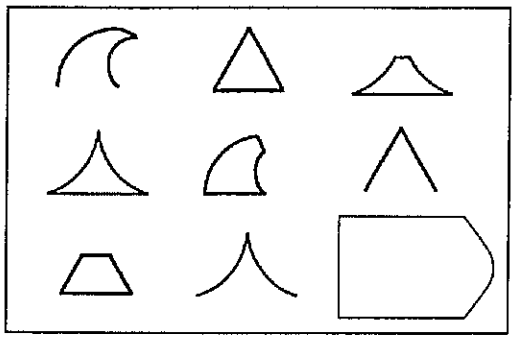
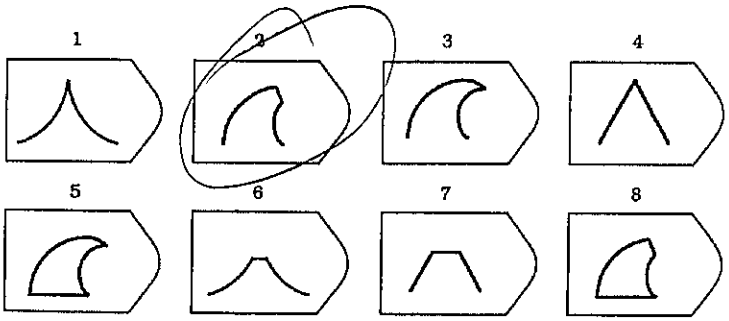
PATTERN 5





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Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Form B Test 1 Student ID A4205243 Campbell

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

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C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48085

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

[redacted]

STUDENT NAME: A37669797 **GROUP:** 22?
Version B

90

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   (d.) An increase in desert formation resulting in more dusting blowing into the atmosphere

D

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   (b.) Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

B

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

C

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   (c.) A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?

A

   (a.) Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?

B

   a. Reservoir A has a shorter residence time than Reservoir B.
   (b.) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

$RT = \frac{S}{F}$ $A = 2RT = \frac{S}{F}$

$100 = \frac{S}{F}$ $RT = \frac{100}{F}$ 40

$200 = \frac{S}{F}$ $RT = \frac{200}{F}$ 40

$RT = \frac{S}{F}$

6. Which of the following would cause the acidity of Earth's oceans to decrease?

A

   (a.) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

B a. The reservoir will eventually disappear.
(b) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

1000 / 50 = 20
20

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

20.5

A (a) The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

A (a) Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

B a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
(b) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification? 25

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

Ocean acidification occurs when the $CO_{2(gas)}$ in the hydrosphere is hydrated ($CO_2 + H_2O \longrightarrow HCO_3^- + H^+$). This ~~er~~ reaction produces bicarbonate (HCO_3^-) ions as well as H^+ ions. The increase in H^+ ions increases acidity. ~~Too of more~~ CO_2 in the atmosphere is dissolved ~~of~~ in oceans, the dissolved CO_2 ~~more~~ undergoes hydration. Therefore an increase in atmospheric CO_2 would increase ocean acidification because more carbon will be dissolved and converted to HCO_3^- & H^+.

~~positive~~ negative

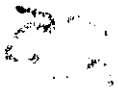
An example of ~~negative~~ feedback is the ~~of~~ increase in atmospher CO_2 causing increase in global temperature (causing water temperature to increase). Warmer water holds less gas, so warmer water would take in less CO_2 and acidification will decease. It is ~~positive~~ negative feedback because there will be ~~more~~ less CO_2 in the ~~atmosphere~~ hydrosphere to be hydrated.

{at the same time increase $CO_{2(gas)}$ in atmosphere will increase the dissolving and acidification process, however.} (less CO_2 to be hydrated

& this is negative feedback to acidification because as water warms it holds less gas, this effect however wouldn't be enough to counter balance acidification

---

Positive feedback for ocean acidification would be more acidification leads to more HCO_3^- & H^+ ions, and the HCO_3^- ions ~~for~~ are biochemically precipitated & this process releases CO_2 into the atmosphere, more atmospheric CO_2 means more of it to be dissolved then hydrated to HCO_3^- & H^+ → increase acidification.



2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Volcanism releases CO_2 into the atmosphere, according to the greenhouse effect visible light from sun that is absorbed by the earth turns into infared energy, the greenhouse gases (CO_2) absorb this infared (heat) energy. They then emit it, and the energy is either absorbed or reflected again, this "traps" ~~gases~~ heat in the atmosphere. With volcanism releasing CO_2 the temperature ~~will~~ would increase, more heat would be "trapped."

However, the increase in ash clouds will prevent visible light from reaching earths surface, causing the temperature to go down. These two processes would balance each other out so temperature change wouldn't be as significant. If the ash were to settle, then the temperature would increase because CO_2 would still be there and ~~it~~ light would reach the earth's surface.

visible energy
temperature goes down because ~~light~~ can't reach ~~sun~~ surface and ~~be~~ turn into infared (heat energy)

25

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

degass → CO_2 (Hydrosphere) → CO_2 atmosphere

Evaporation → ~~gas~~ ~~from~~ liquid ~~going~~ to ~~atmosphere~~ (from liquid in ~~water~~ oceans, etc. to becoming liquid in atmosphere

ON BACK...

earths surface or the ~~hydrosphere~~ hydrosphere

Evaporation is when liquid goes from ~~a reservoir~~ ~~(ocean, lake, etc.)~~ ~~Earths surface~~ to becoming liquid in the atmosphere.

Degassing is when CO_2 in the hydrosphere becomes CO_2 in the atmosphere.

Similar because molecules in both process move from ~~earths surface~~/ water sources to the atmosphere

Different because evaporation involves H_2O, degassing involves CO_2

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Form B

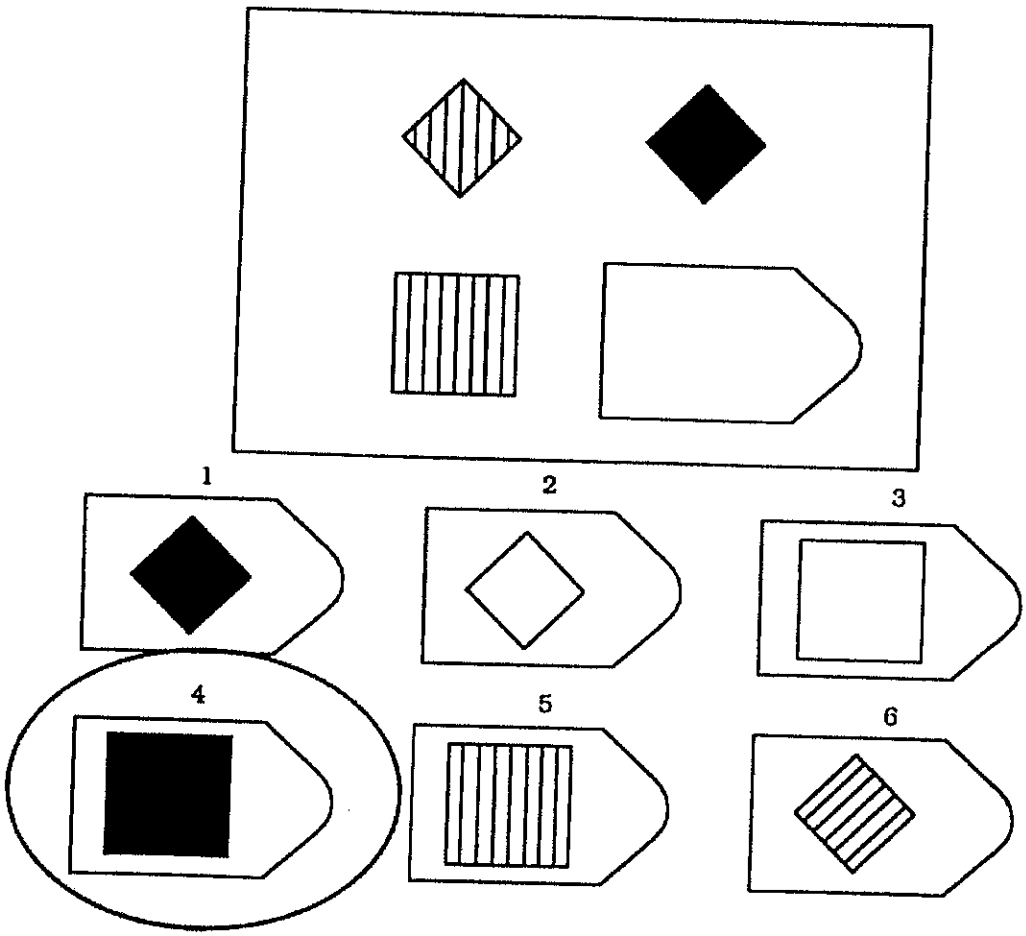
Test 1

Student ID _____

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example

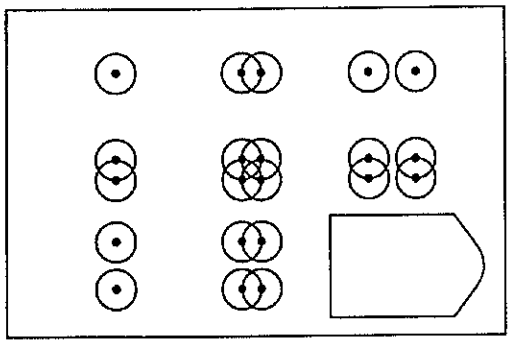


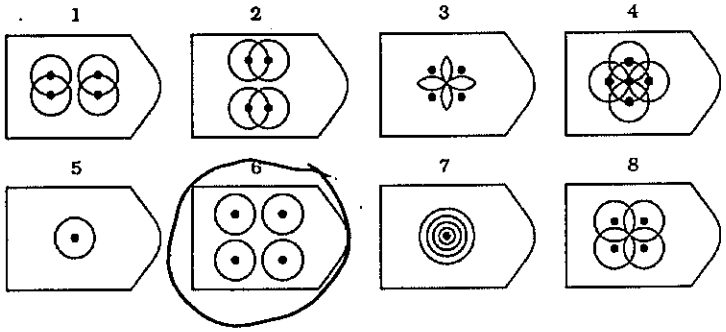
Answer: 4

PLEASE CONTINUE ON NEXT PAGE

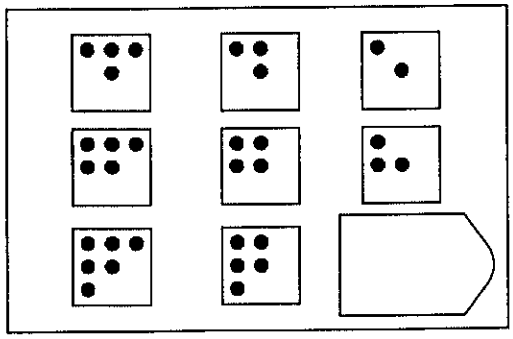
Please choose the image that best completes each of the following patterns.

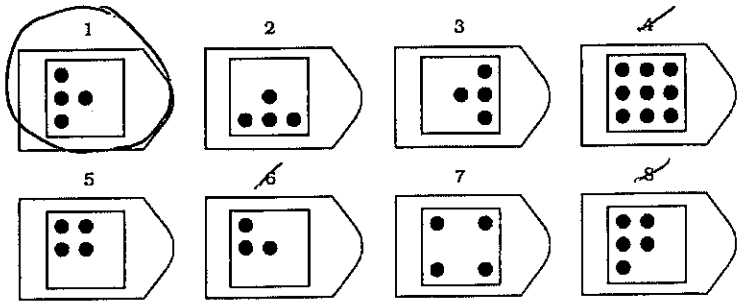
PATTERN 1





PATTERN 2





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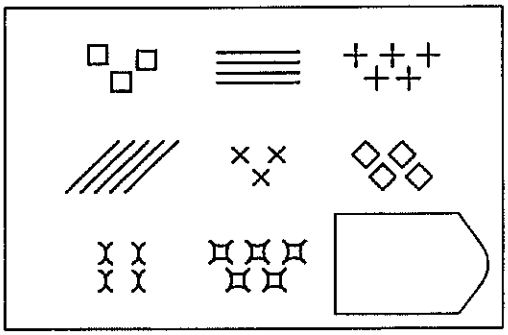
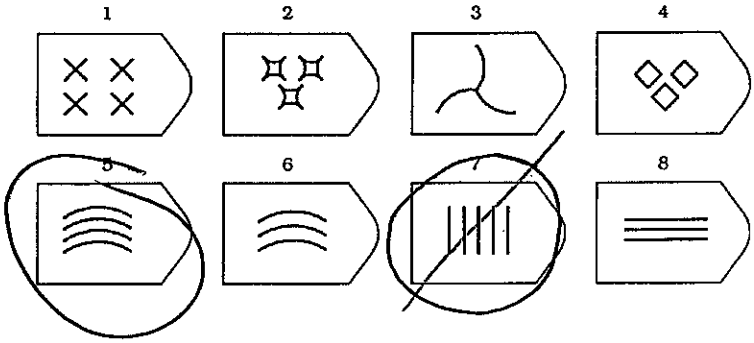
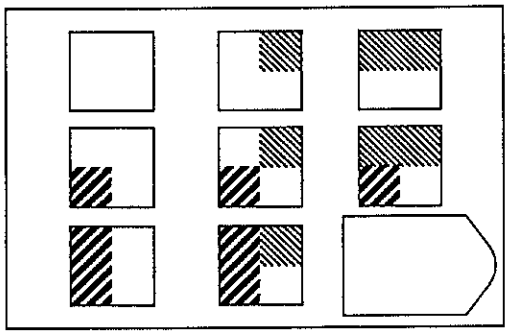
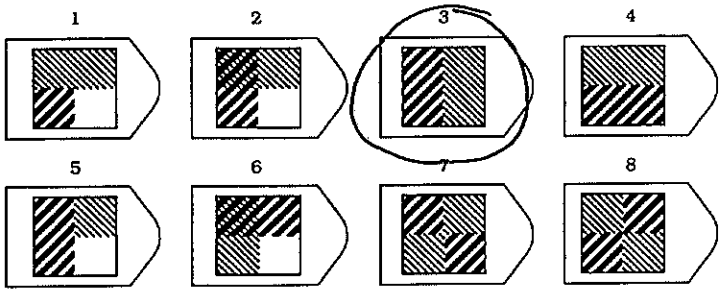
PATTERN 3





PATTERN 4





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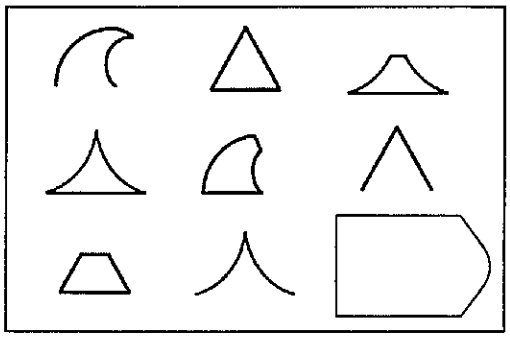
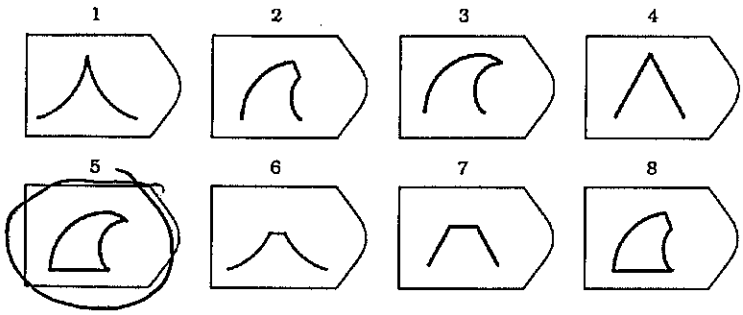
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

(A.) Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

(B.) Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

(D) Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 48363

What is your gender?

X Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
___Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
X Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42829869 **GROUP:** 22
Version A

88

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

2. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

Same inflow outflow and are equal

100/2 1000/2

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
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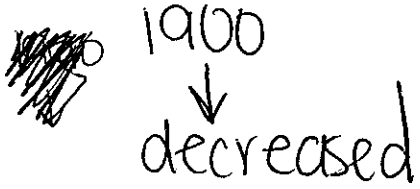
10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.



SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

25

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

(more greenhouse effect because more CO2 in atmosphere (greenhouse gas))

ocean acidification is the process where carbon dioxide molecules combine with hydrogen ions that make the acidity in oceans rise. ~~Colder ocean temperatures have the ability to absorb more~~ An increase in atmospheric CO_2 would also cause an increase in oceanic CO_2 which would therefore cause ocean acidification to rise. because more CO_2 ions would chemically bond with the hydron (H) ions. A positive feedback associated w/ ocean acidification, for example, can be the Industrial Revolution, where more fossil fuels are being burned, increasing CO_2 levels in the atmosphere, creating more CO_2 ions which will link with hydrogen ions, to form acid rain for example and the acid rain will increase ocean acidity. This is a positive loop because it increases, speeds up ocean acidity. A negative feedback loop would slow down ocean acidification. An example could be increased ~~albedo effect because the earth becomes reflective and more heat is reflected into space because temps decrease in atmosphere & oceans & decrease cold water~~ → Greenhouse Effect, which increases atmospheric temps & ocean temps. warmer Ocean ~~temp~~ water has less ability to absorb CO_2 so ocean acidification would decrease. ← negative feedback

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The Greenhouse Effect is the process through which greenhouse gases trap in heat. visible heat. Energy from the sun hits Earth's atmosphere. some is absorbed and some reflects back into space. the energy that is absorbed is converted to infrared. The infrared bounces off and is trapped in by the greenhouse gases. The green house gas re-emit the infrared waves because they dont absorb them. Essentially, the greenhouse gases trap in heat in Earths atmosphere. The increase in volcanism creates a cloud block which will block in the incoming energy from the sun. this will decrease temperatures. however, when clouds form, energy is being released which has a tendency to increase temperatures. Overall I think the cloud block would block a lot of energy from the sun and temperatures would decrease. 18

(block solar radiation)

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

liquid to gas.
liquid to a gas X
liquid to water vapor (gas)

Earn up to 1 additional point on your course grade

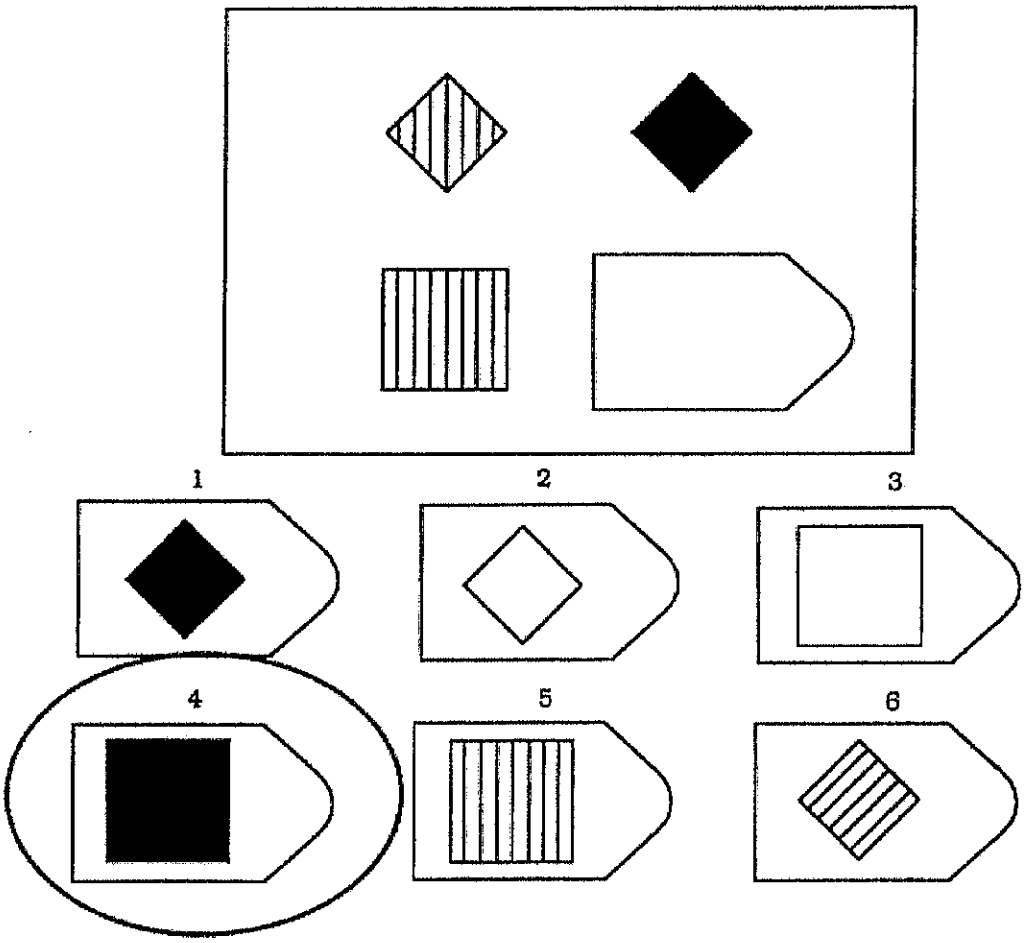
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

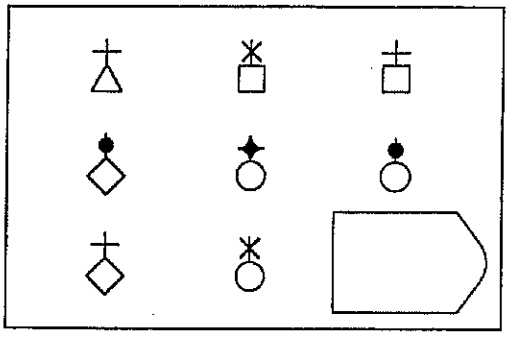
PLEASE CONTINUE ON NEXT PAGE

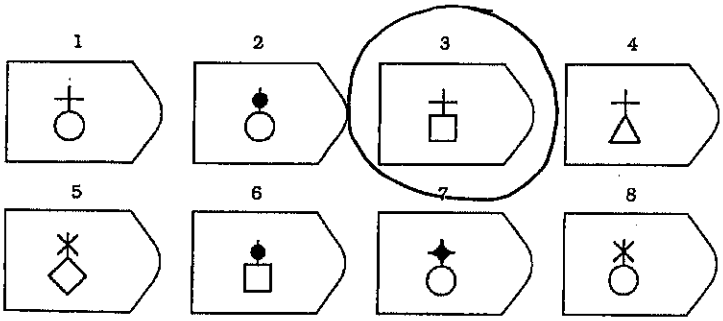
Form A Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

PATTERN 1

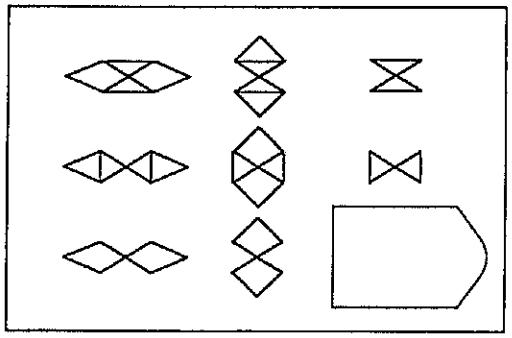
3

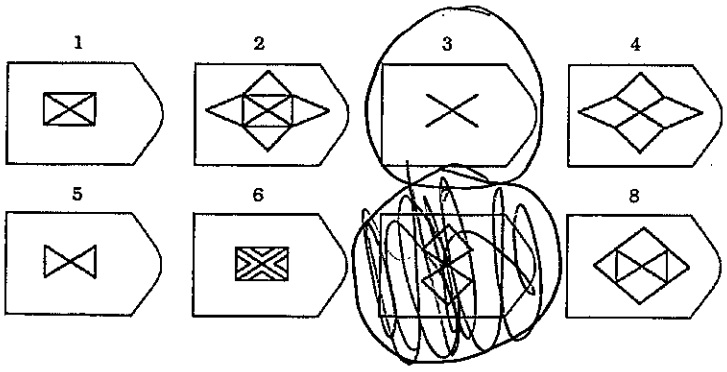




PATTERN 2

3





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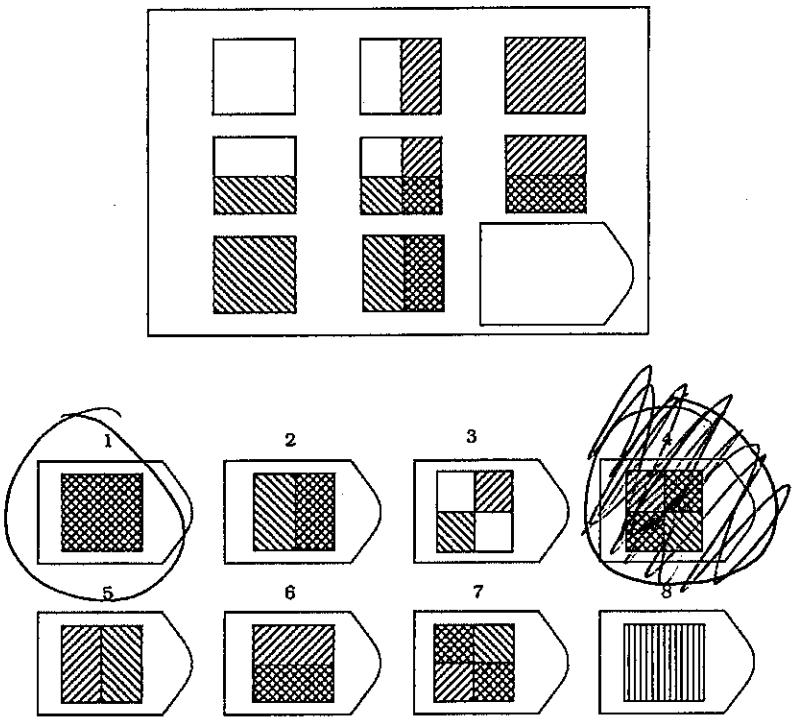
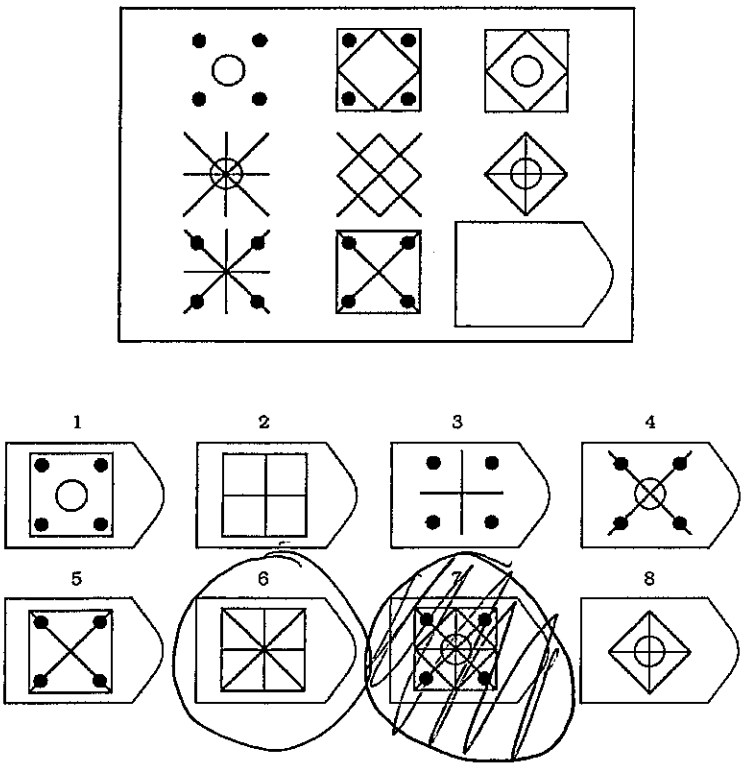
PATTERN 3

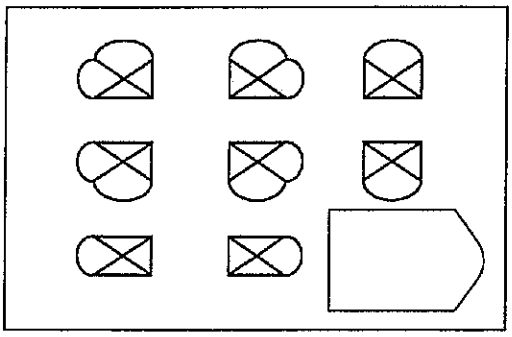


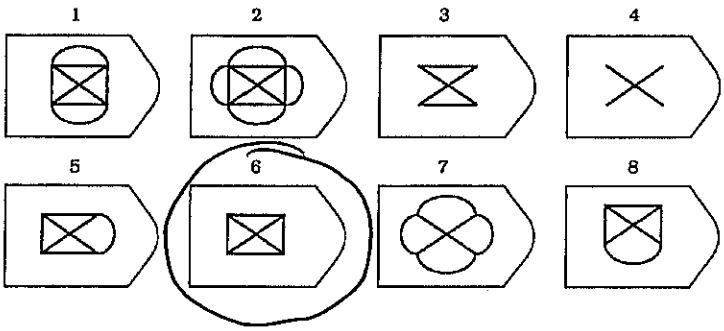
PATTERN 4



PLEASE CONTINUE ON NEXT PAGE

PATTERN 5





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A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 19 **years**

What is your home zip code? 48026

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
X Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A42839439 **GROUP:** 22
Version A

78

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

2. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

6. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

9. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

10. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in atmospheric carbon dioxide would affect the ocean acidification by becoming more acidic. Since there is more CO_2 in the atmosphere the more CO_2 will settle in the ocean. When the carbon dioxide settles with H_2O it dissolves and forms HCO_3. With this happening, it will create effects like a decline in the fish population & decline of coral reef. The more CO_2 in the ocean the colder the ocean gets, making the influx of CO_2 increase, causing the PH levels of the ocean to rise as well. So while more gases in the atmosphere the higher the PH level of the ocean. Positive feedback would be while the Residence time in one is increased, so will the other residence time in other reservoir causing the system to all change together to reach equilibrium. Negative feed back would be the change in temperature?

20

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

23

The greenhouse effect is the process in which the Earth receives heat that is emitted by the suns solar energy. The sun gives off visible ~~heat~~ wave lengths that are hard to be absorbed by molecules, & by greenhouse gases. So the wave lengths pass thrugh the atmosphere into the earths surface where it is ther either absorbed or reflected. When the heat is reflected, the heat doesn't affect the temperature of the atmosphere, - simply goes into space. If the heat is then absorbed, the heat gets excited & then re-emits in all diffente directions. Then, it can either be reflected into space, or be reabsorbed, being known as trapped in the green house effect. When volcanism occurs, it then gives off large ash clouds that float in the atmosphere. With these clouds there, they placed where the visible wave lengths proceed, & then end blocking the pathway, with the ash clouds there, it prevents heat to the earth & then is reflected back into space like in the greenhouse effect, when the wave lengths are reflected the heat can be absorbed causing the temperature to decrease, but the increase in CO_2 tend to rise. Overtime til the ashes settle at the temperature will be low.

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

through gravitational + thermal energy

Evaporation is the transformation from liquid to gas while degassing is changing the gas formed into a solid or liquid.

Earn up to 1 additional point on your course grade

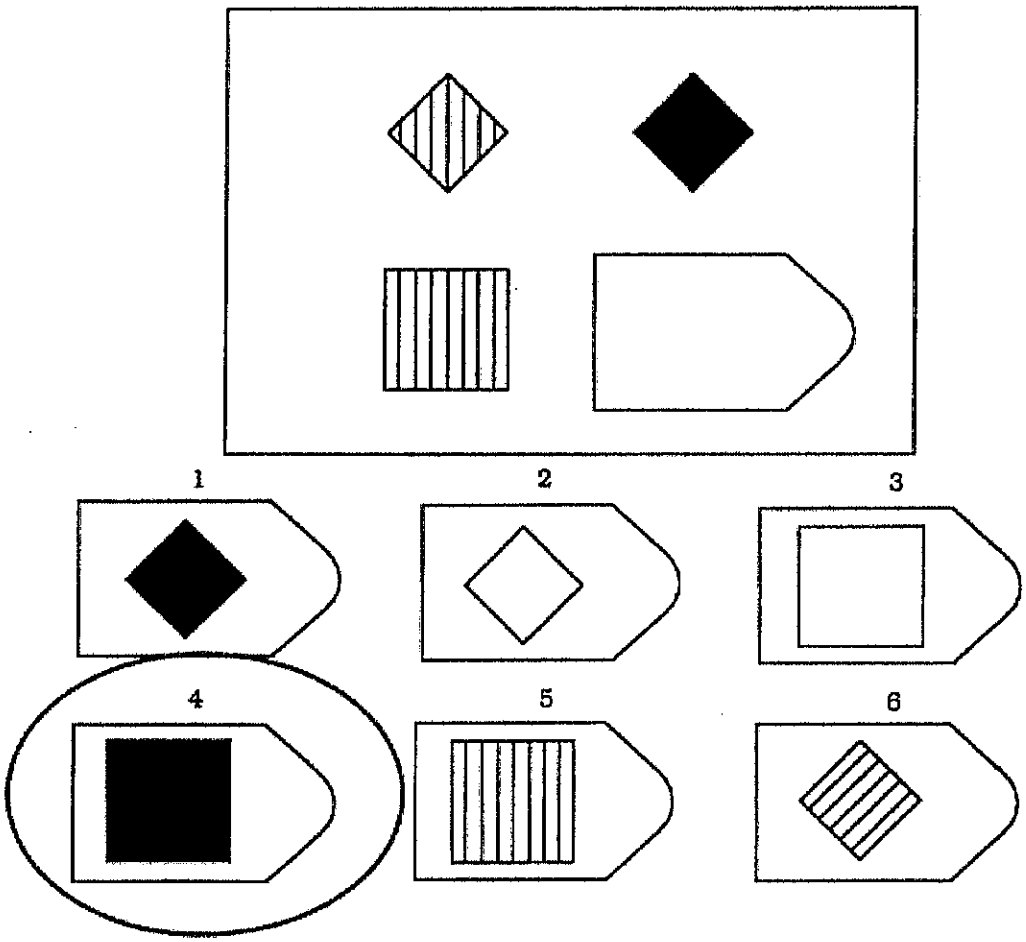
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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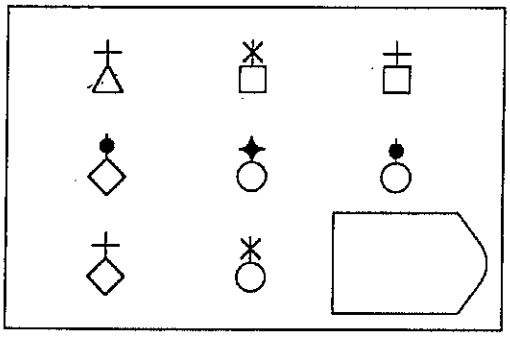
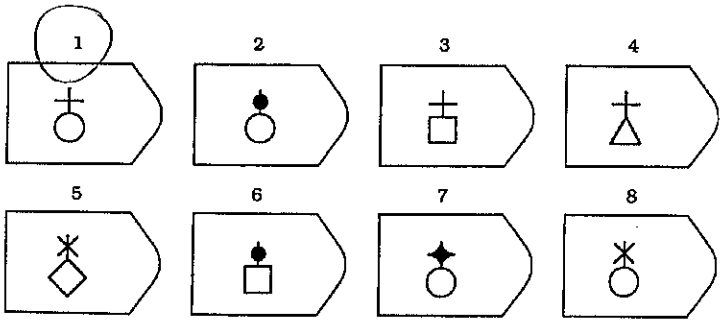
Form A Test 1 Student ID 42839439

Please choose the image that best completes each of the following patterns.

PATTERN 1





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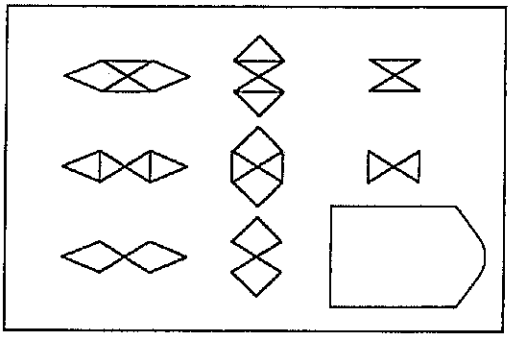

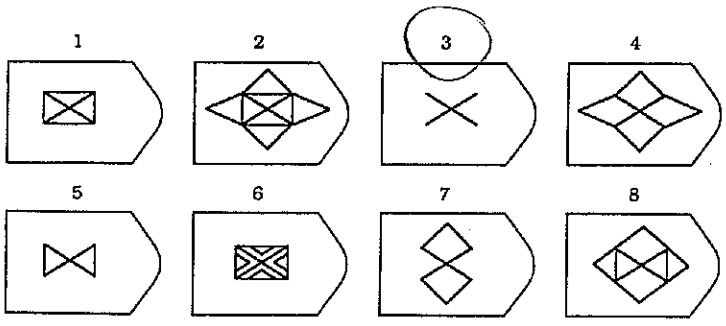

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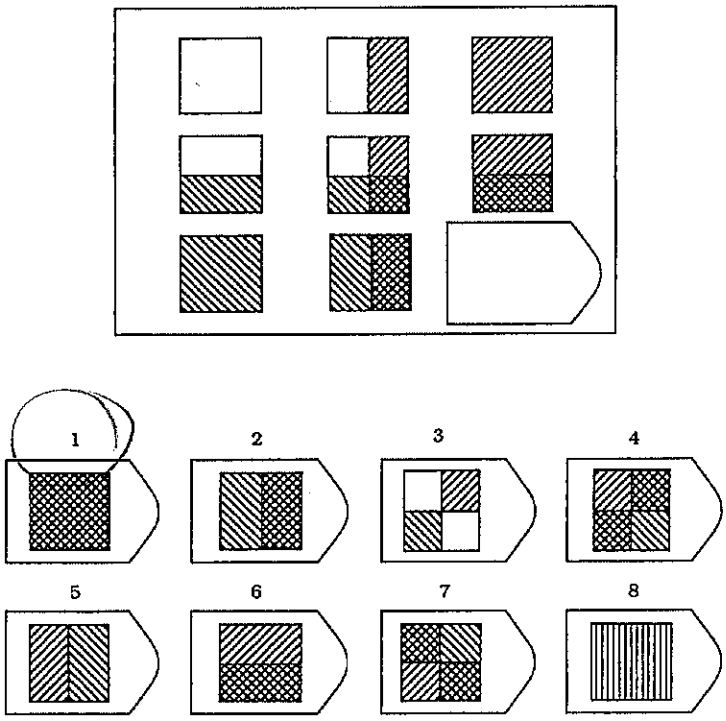
PATTERN 3



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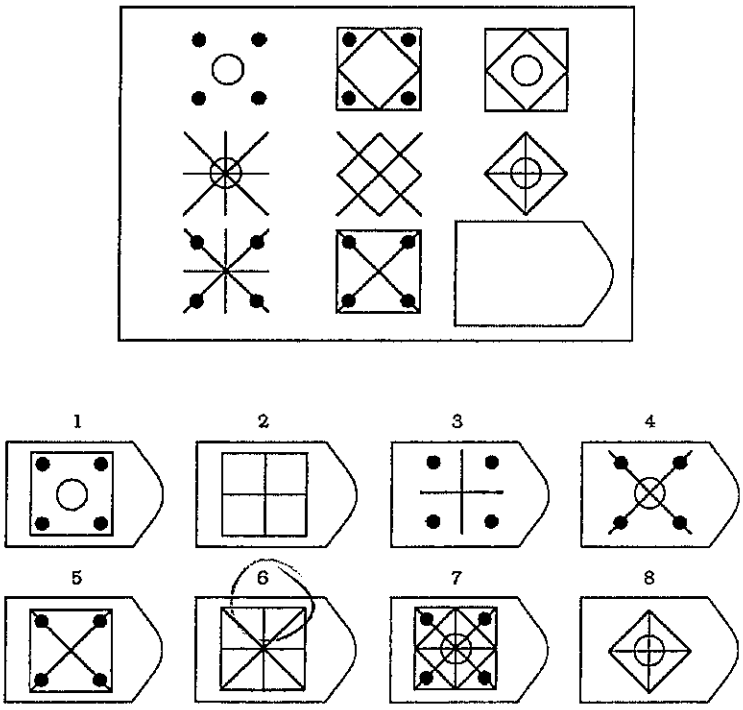

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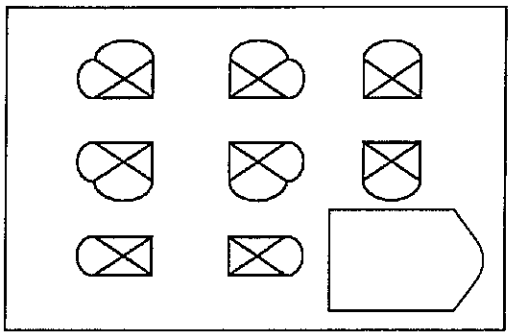
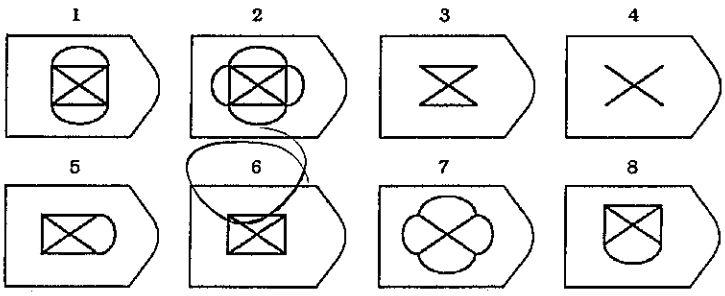
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. The thieves knew that the driver would only be in the restroom for a short time, so they worked quickly to pick the lock on the armored car.

A. The experienced locksmith did not need much time to remove the padlock that no longer had a key.

B. Tommy knew that his parents would be angry, so he hacked into the school's database and changed his grades.

C. When John noticed that the guest speaker was free for a minute, he hurried over to talk to him and ask advice.

D. Prometheus stole fire from the top of Mt. Olympus and brought it to mankind, allowing great advances in human civilization.

2. After only a week of vegetarianism, George relapsed into his prior meat-eating habits.

A. Before the annual parade, the city council decided to renovate one of the buildings downtown.

B. During a visit to the doctor, Emily was informed that she must take more vitamins to continue her vegetarian diet.

C. Despite requests from her family, Lisa continued to overwork herself with long hours at the lab.

D. Even though her New Year's resolution was to spend less time on Facebook, by February Anna was again logging onto Facebook every five minutes.

3. The surveillance aircraft returned to its base with photographs and intelligence for the country's leaders, allowing a critical defense strategy to be set up.

A. The lioness came back after the hunt and brought freshly killed meat to her cubs, satisfying their growing need for food.

B. Allison took her pedigreed border collie to the professional groomer, and ensured that the collie would be looking its best at the dog show.

C. Joan returned home from work with some takeout from an Indian restaurant, but her kids had already eaten.

D. The spy amassed hundreds of photos of the enemy's weapons production plant, and still nothing could be done to stop them from developing nuclear weapons.

4. The rival gangs used graffiti to define their territorial boundaries.

A. The toddler wrote on the walls with pens when the babysitter wasn't looking.

B. Artists were commissioned to paint murals on the sides of old buildings in an effort to beautify the city.

C. The cat rubbed against the new sofa, marking it with her scent and claiming it as her property.

D. The government that was installed after the coup proved to be very unstable, and soon the original regime was back in control of the country.

PLEASE CONTINUE ON NEXT PAGE

5. The father repaired his daughter's toy, since he had been the one who accidentally stepped on it.

A. The plumber fixed the pump that had burst and flooded the basement.

B. Steven avoided midweek outings in order to have the time for a weekend trip out of town

C. The groom's mother mended her son's tuxedo since he had torn a hole in it.

D. The supplier realized that he had failed to make an important shipment, and immediately sent it Federal Express at his own expense.

Please choose the response that is closest to an analogy that you might make.

1. A balloon floating is like…

A. An ice cube in water. They are similar because they both are less dense than the surrounding material.

B. A leaf in the air. They are similar because they both move through the air carried by the wind.

C. Blowing bubbles. They are similar because they both float until they eventually pop.

D. A cloud in the sky. They are similar because they both float and are carried by the wind.

2. Catching a cold is like…

A. Getting the flu. They are similar because they are both caused by viruses.

B. Getting pink eye. They are similar because they are both contagious.

C. Getting the flu. They are similar because they are both caused by not washing your hands.

D. Forgetting to do your homework. They are similar because they are both preventable.

E. Not getting enough sleep. They are similar because they both involve a weakened immune system.

DEMOGRAPHICS

What is your age? 18 **years**

What is your home zip code? 48329

What is your gender?

___Male
X Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
___Caucasian
___Latino/Hispanic
X Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A41729348 **GROUP:** 22 45
Version B

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in atmospheric carbon dioxide would affect ocean acidification by adding more CO_2 ~~ions~~ into the ocean and then combining with Hydrogen ions? which makes the acidity of the ocean higher. With more CO_2 in the the atmosphere this causes it to precipitate ~~down~~ to earth, and that's how it would get into the oceans. This would be considered a positive feedback loop, because if the CO_2 increases in the oceans causes more acidity, that water would evaporate and condense into clouds with CO_2 ions in ~~it~~ back then. Causing more CO_2 to precipitate back down and start the process all over.

With more CO_2 in the atmosphere the global atmospheric temperature would increase. This will cause an increase in ocean temperature. Cold water is a better absorber of gases than warm water. So the ocean would absorb less CO_2, so then in return the ocean Ph would decrease. some

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2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The greenhouse effect is the process in which the earths atmosphere become heated by energy coming from the sun. The sun sends visible energy which passes through the atmosphere and either reflects off of earths surface or is absorbed. Its reflected back as ~~UV rays~~ IR and then gets trapped in the atmosphere and continues to bounce back and forth in our atmosphere.

ack

> explain

When volcanism add ash to the atmosphere the amount of visible solar energy reaching earths surface would have decreased. The increase in volcanism would cause more ash blocking the passage of solar energy into the atmosphere. This will cause the cooling of the atmospheric temperature. This will cause a global cooling which is considered ~~a negative feedback~~.

~~25~~

Since 15

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Evaporation is the Grassing of water molecules, and degassing is when gas bubbles in magma dissapears, slowing its rise to surface

Earn up to 1 additional point on your course grade

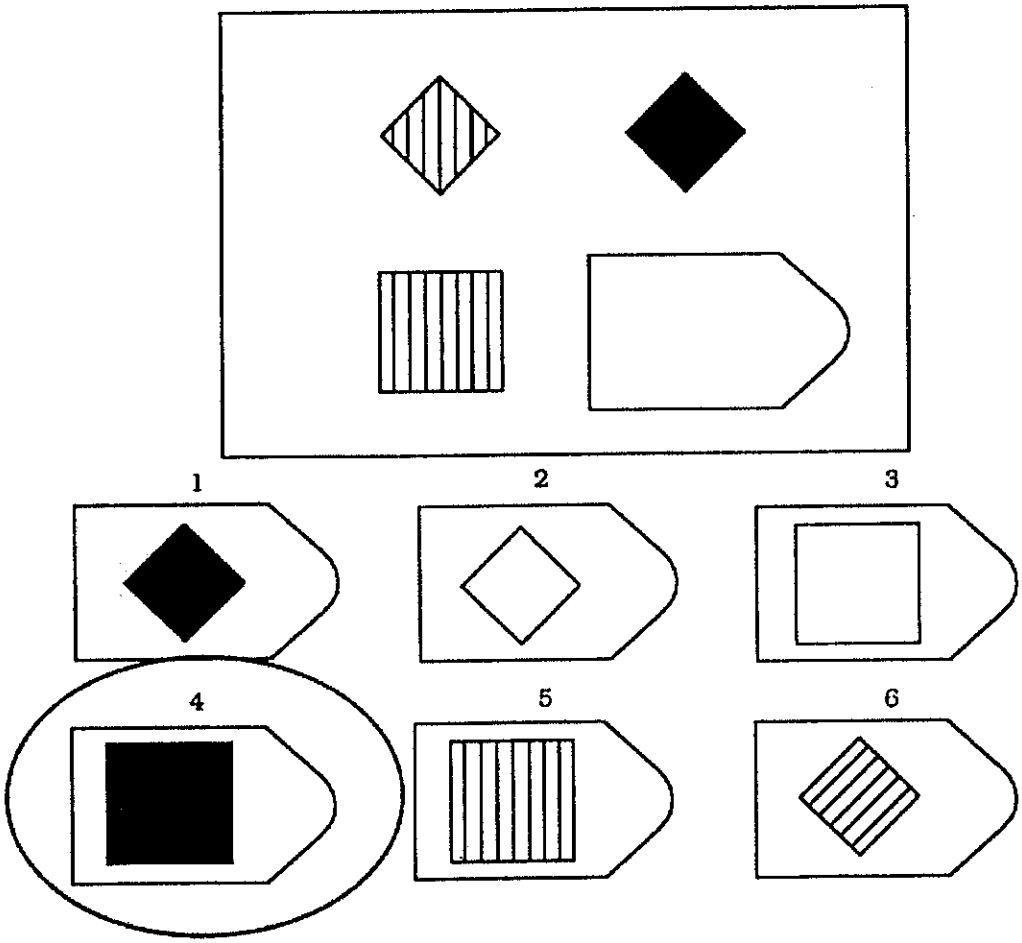
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example

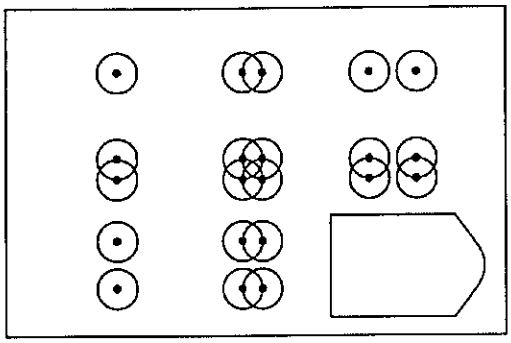


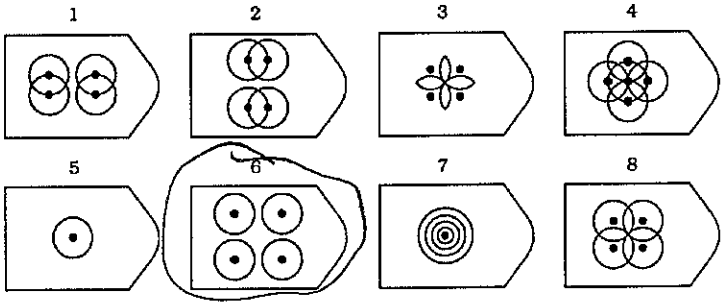
Answer: 4

PLEASE CONTINUE ON NEXT PAGE

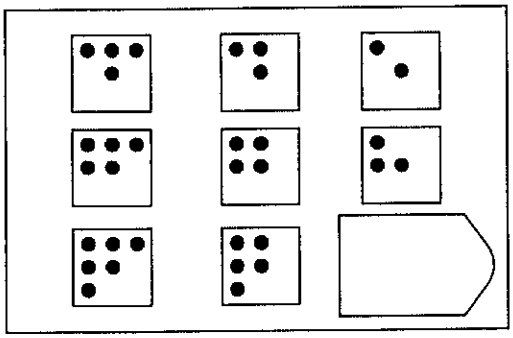
Please choose the image that best completes each of the following patterns.

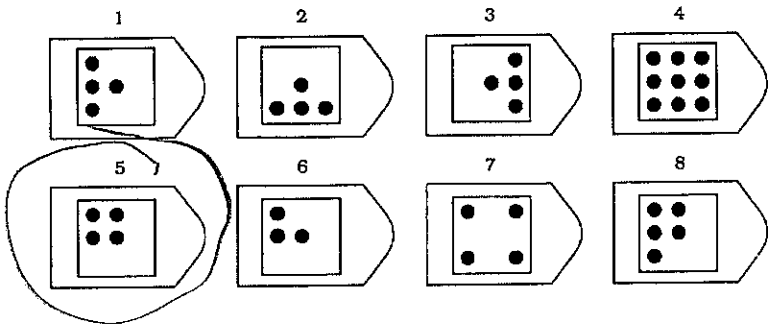
PATTERN 1





PATTERN 2





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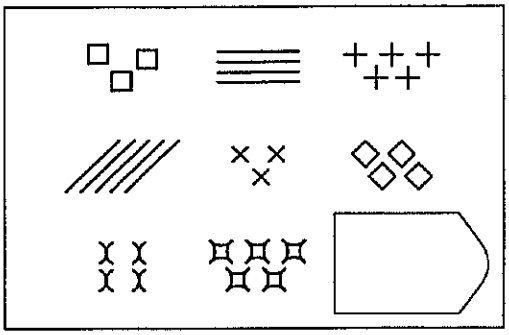

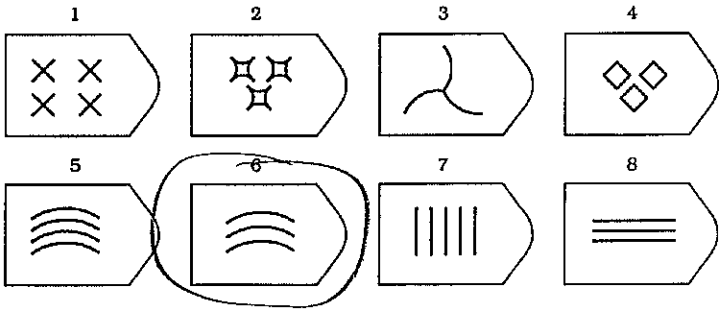

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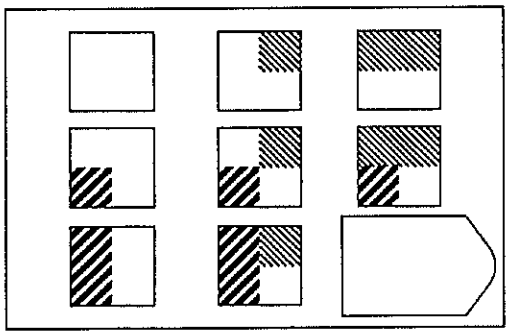

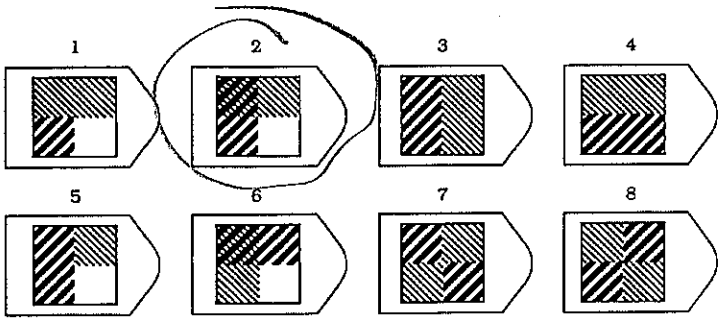

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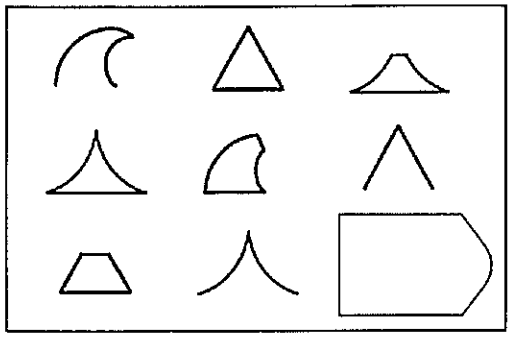
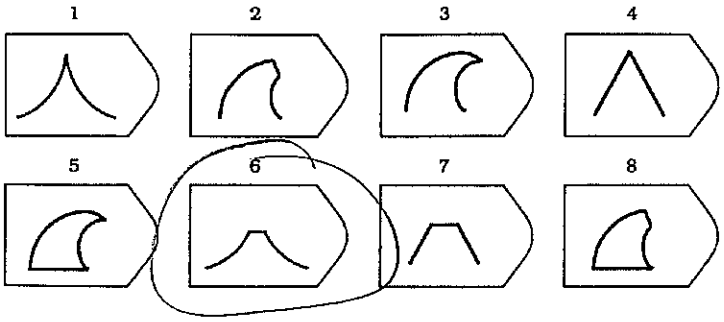
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
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C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

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A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

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D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B (B) Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A (A.) Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C (C.) Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 60181

What is your gender?

√ Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

√ African American/Black
___Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43050270 **GROUP:** 23 87
Version B

MULTIPLE-CHOICE. 5 points each (50 points total).

D **1.** Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
(d) An increase in desert formation resulting in more dusting blowing into the atmosphere

B **2.** Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
(b) Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

C **3.** Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
(c) A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

B **4.** Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
(b) Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

B **5.** Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
(b) Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

A **6.** Which of the following would cause the acidity of Earth's oceans to decrease?
(a) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B 7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
(b) The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

1000 / 150 = 6.6
15 | 100 (90, 10)

D 8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
(d.) The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

B 9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
(b) Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

B 10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
(b) More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification? 25

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

If there are more carbon dioxide in atmosphere, according to the equation, $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$, more CO_2 will dissolution in the ocean. This process with cause the acidity of the ocean's to increase. But on the other hand, an increase in atmospheric CO_2 will cause the temperature gose up. This is due to greenhouse effect. According to the principle 5, increase the temperature will cause molecus move faster, so there will be more molecus of carbon dioxide come out of ocean. This process will decrease the acidity of the ocean. But the first process will affect more on ocean acidification. For the first process, increase temperature cause the increase of acidity, so it is positive feedback. The second process, increase temperature cause the acidity of ocean's to decrease, this is negative feedback.

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

22

If the volcanism cause that erupt large ash clouds, it will cause less solar radiation come to the surface, so this will cause the decrease of earth's temperature. But because of less solar radiation come to the earth, there will be less photophysis happen. So this will lead to more CO_2 which is greenhouse gas be in the atmosphere. According to the Greenhouse effect, it is a process of themal energy that the radiation from other planty surface to absorb by earth atmosphere's greenhouse gases such as CO_2, H_2O vapor, CH_4. So if there are more these kind of gases in atmosphere, the themal energy radiation will be absorb more. This process will cause the increase of atmospheric temperature. So, if volcanism on Earth suddenly increase dramatically, particularly volcanoes that erupt large ash clouds, it were cause the increase of atmospheric temperature.

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

Earn up to 1 additional point on your course grade

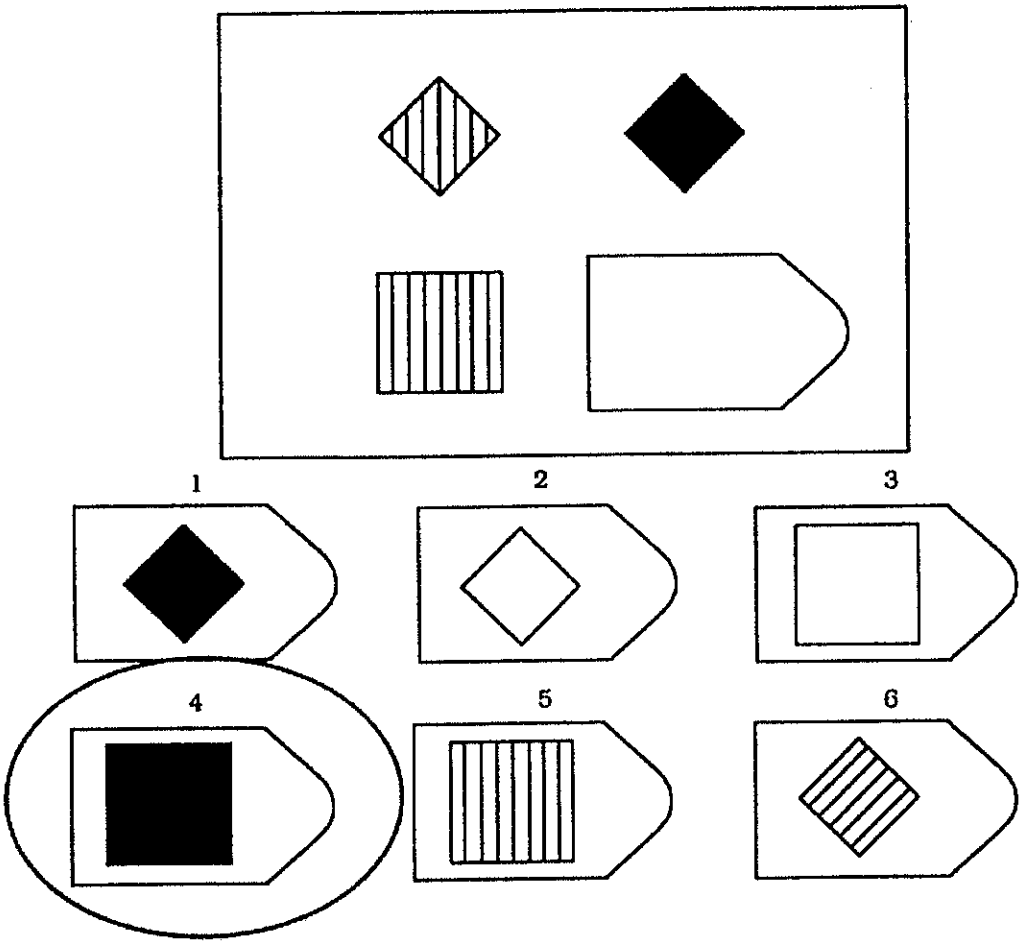
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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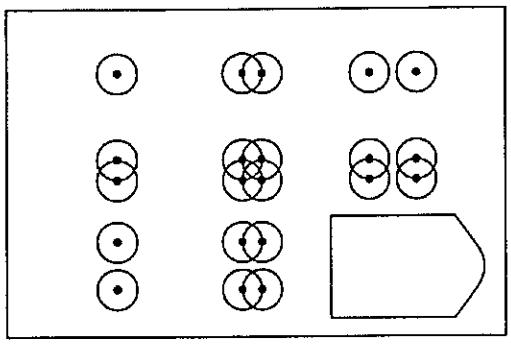
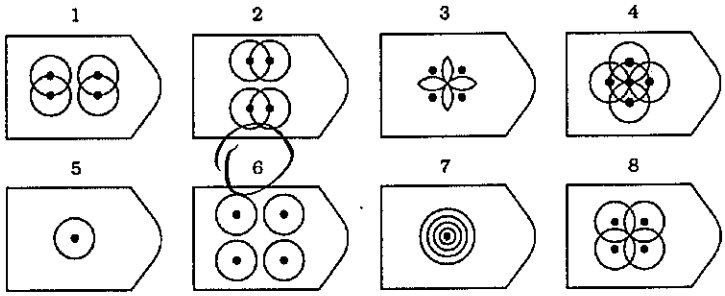
Form B Test 1 Student ID _____

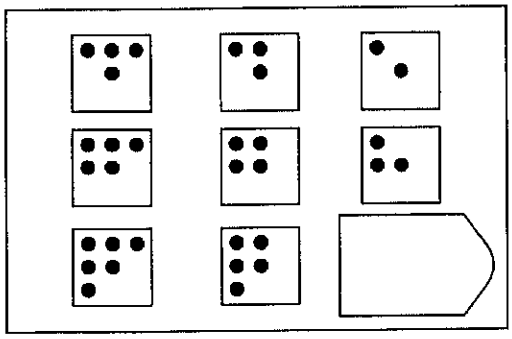
Please choose the image that best completes each of the following patterns.

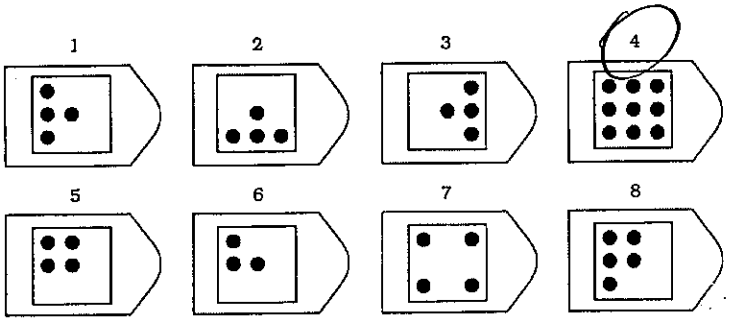
PATTERN 1





PATTERN 2





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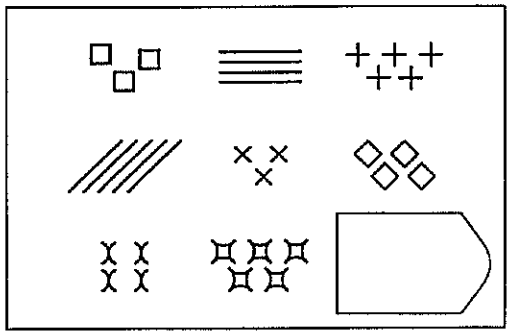
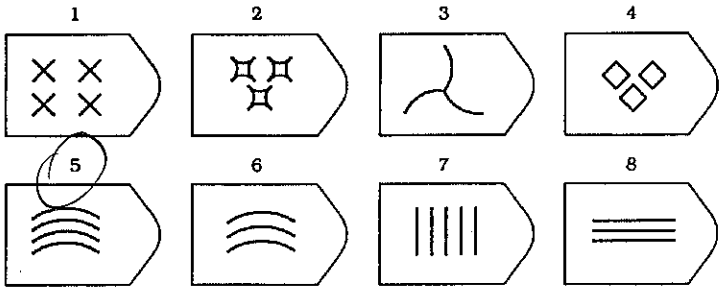
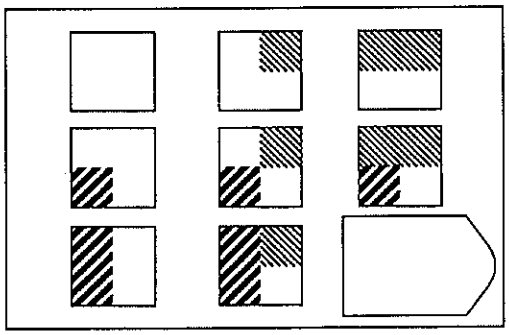
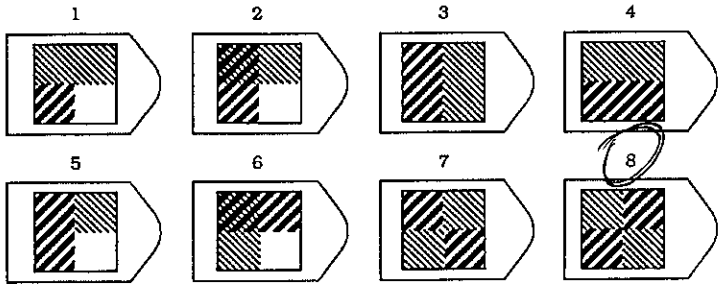
PATTERN 3





PATTERN 4





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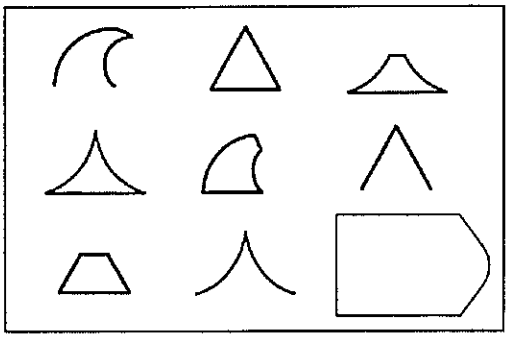
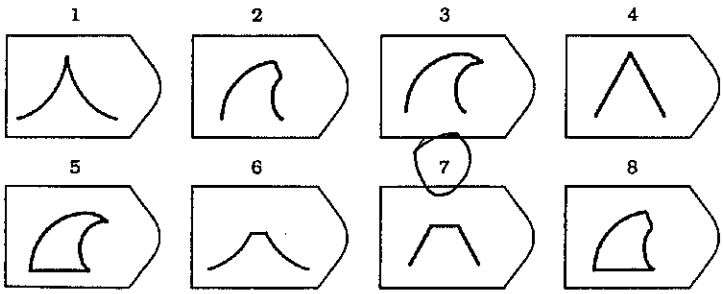
PATTERN 5





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B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

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D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

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C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

(C) Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 20 **years**

What is your home zip code? 48825

What is your gender?

✓ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
___ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
✓ Other Asian

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A39474585 **GROUP:** 23 87
Version B

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   (d) An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   (a) The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   (c) A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   (a) Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
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   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   (a) An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
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   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

25

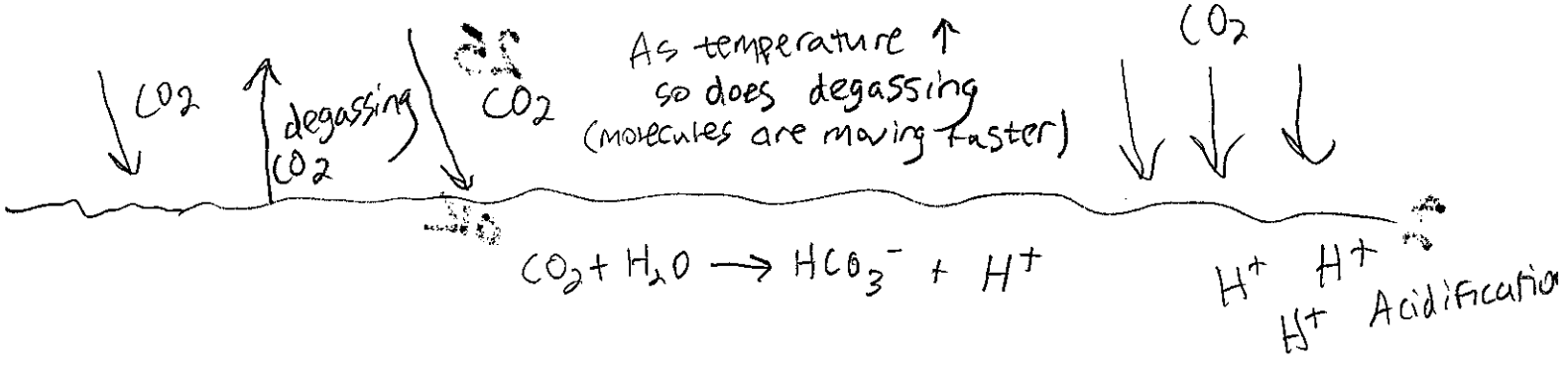
Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

a. Ocean acidification is the process in which CO_2 reacts with water to form bicarbonate and hydrogen ions. It is the hydrogen ions which lowers the pH of the oceans ✓ and makes them more acidic. An increase in atmospheric CO_2 will also increase oceanic CO_2 through dissolution because the two systems are trying to stay in equilibrium. Because of this increase in CO_2 in the oceans, there will be more hydrogen ions released and the oceans will become more acidic. this is an example of a positive feedback loop. Also, the increase in CO_2 in the atmosphere will increase atmospheric temperatures, which will increase ocean temperatures as well. Cold water holds gases more tightly than warm water, so the increased ocean temperatures will result in more degassing and less acidification. Overall, increased atmospheric CO_2 concentration will increase ocean acidification, but not at a proportional rate because of degassing resulting from higher ocean temperatures. (negative feedback loop).

negative feedback loop →



2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Volcanism is a process that can release large amounts of ash that can remain in the atmosphere for long periods of time. Volcanos also release greenhouse gases such as CO_2. The greenhouse effect is where visible light from the sun enters through the atmosphere and is either absorbed by the earths surface or oceans, or reflected back (albedo effect) depending on the surface. Ice for example reflects most of this light back. Light in this form reflected back does not heat the earth. It has to be absorbed and transformed into infared energy. When this light is reflected back, it can be absorbed easily by greenhouse gasses. These gasses then emit the infared energy back to the earth where it can be re-absorbed or reflected back again. This cycle continues and results in global warming. Large ash clouds in the atmosphere would decrease the amount of visible light that makes it to the surface. This would also decrease the amount of infared light that can be absorbed by greenhouse gases. This would cause the atmospheric temperature to decrease as well. This is an example of a positive feedback loop.

25

Extra credit (2 points).
How are evaporation and degassing similar and/or different? OK

Evaporation is the change in water from a liquid to a gas. Degassing is the change CO_2 from gas in the ocean to gas in the atmosphere. They both are moving to the atmosphere but H_2O is changing states

Earn up to 1 additional point on your course grade

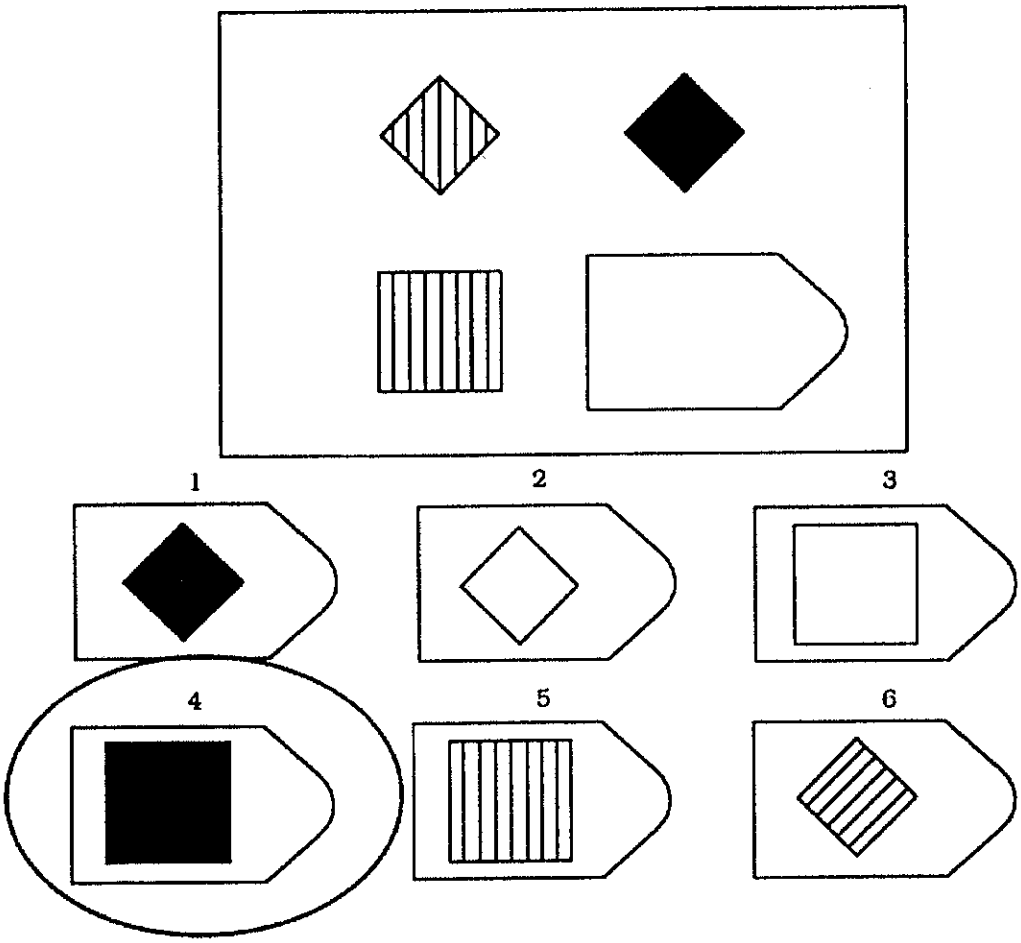
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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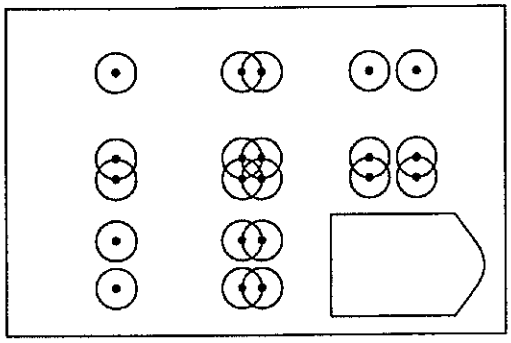
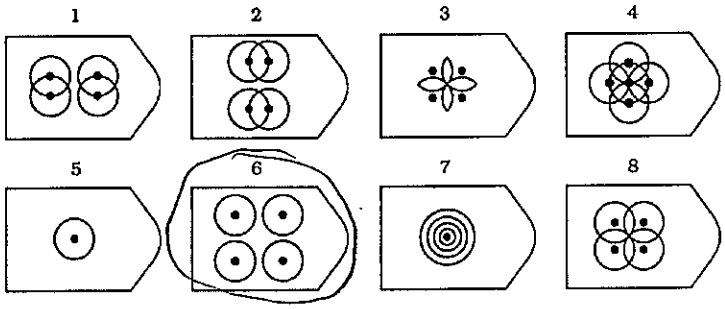
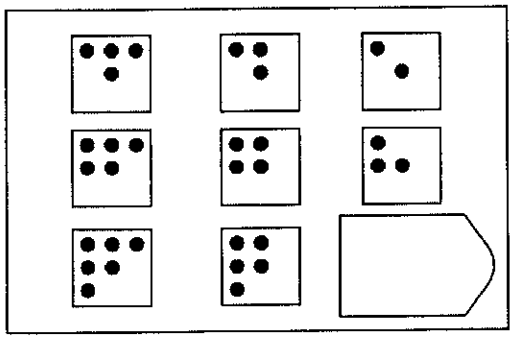
Please choose the image that best completes each of the following patterns.

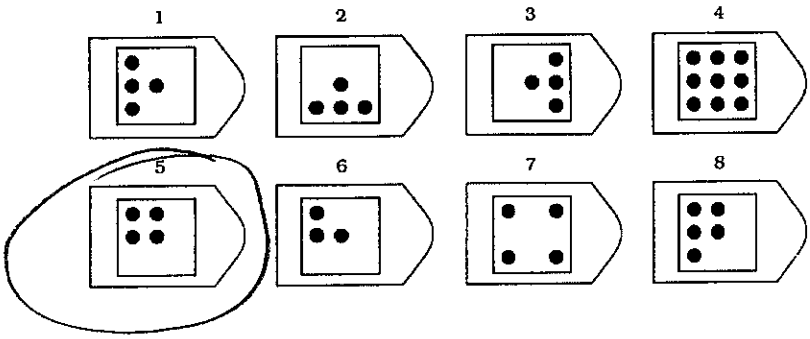
PATTERN 1





PATTERN 2





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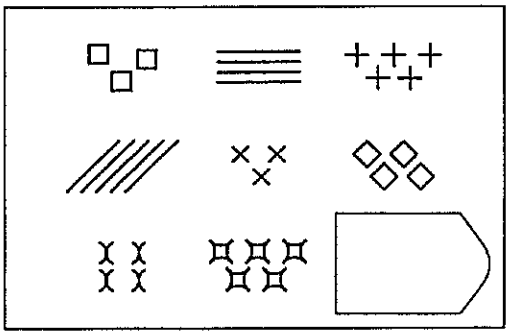
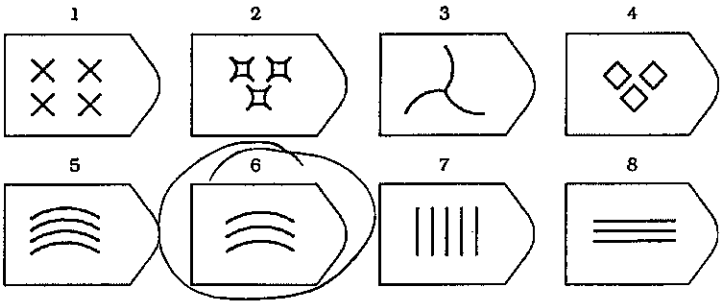
PATTERN 3





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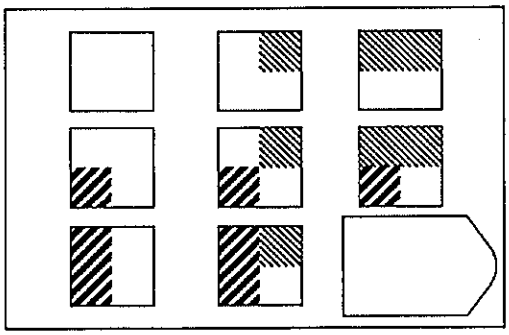

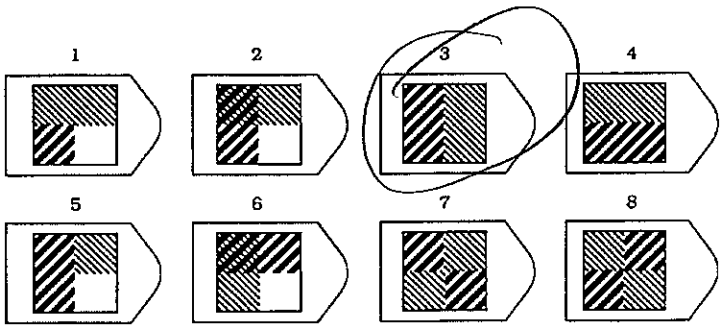

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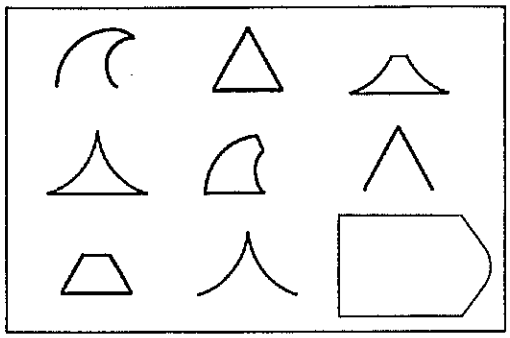
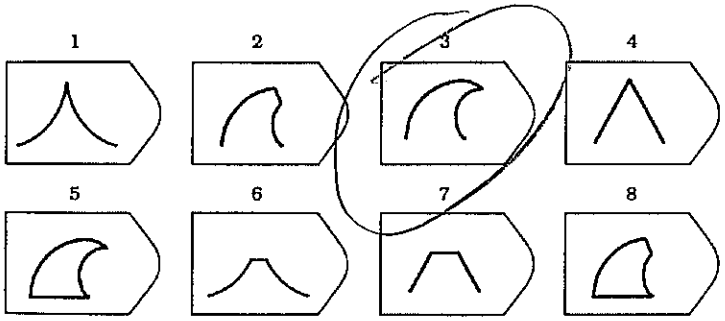




In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 21 **years**

What is your home zip code? 48393

What is your gender?

X Male
___Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
X Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A39732455 **GROUP:** 23
Version B

93

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed ↑
   b. Melting of permafrost resulting in more methane escaping into the atmosphere ↑
   c. An increase in evaporation and cloud formation resulting in the release of latent heat ↑
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

RT = Amt / Flow

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

A 2/1 B 1/1

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

T en released to Form

A29732455

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:
a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$
b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

22

A.) The process of ocean acidification involves carbon entering the ocean in many forms, mainly CO_2. This CO_2 is the converted into bicarbonate (HCO_3^-) and H^+ ions, which cause ocean acidity. One process that converts CO_2 to HCO_3^- is biochemical precipitation. An increase in CO_2 in the atmosphere would result in an increase in ocean acidity, because?

B.) • Positive feedback loops dealing with this would be an increase in ocean acidification would cause more CO_2 to be degassed into the atm. causing increase temp. More CO_2 in the atm. means more CO_2 in the ocean, which means increase ocean acidity and so on.

• A negative feedback loop would be increased CO_2 in atm increases both temp. + ocean acidity. increased temp in atm causes increase temp. in oceans. The warmer the water, the less CO_2 it can hold, decreasing acidity, thus negative feedback

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

SC

A.) When a volcanoe erupts it releases a lot of ash and other things into the atm, One of these is sulfur dioxide. More about this later. When light enters the atm, it light is absorbed by certain surfaces and sent back as IR light, which equates to heat. This is then trapped? and sent back by greenhouse gases, which heats our planet.

B.) The sulfur dioxide released by the volcanoe will go up into the atm and reflect light coming in back to space, thus it cannot be absorbed & changed to heat. This results in a decrease in atmospheric temperature. After awhile the sulfur dioxide will go away and temp. will begin to increase.

24

Extra credit (2 points).
How are evaporation and degassing similar and/or different?

- Similar: they both involve the movement of molecules, CO_2 from ocean to atm & H_2O from water to atm.
- Diff: in degassing CO_2 does not change states, in evaporation, water goes liquid to gas

A38732455

Earn up to 1 additional point on your course grade

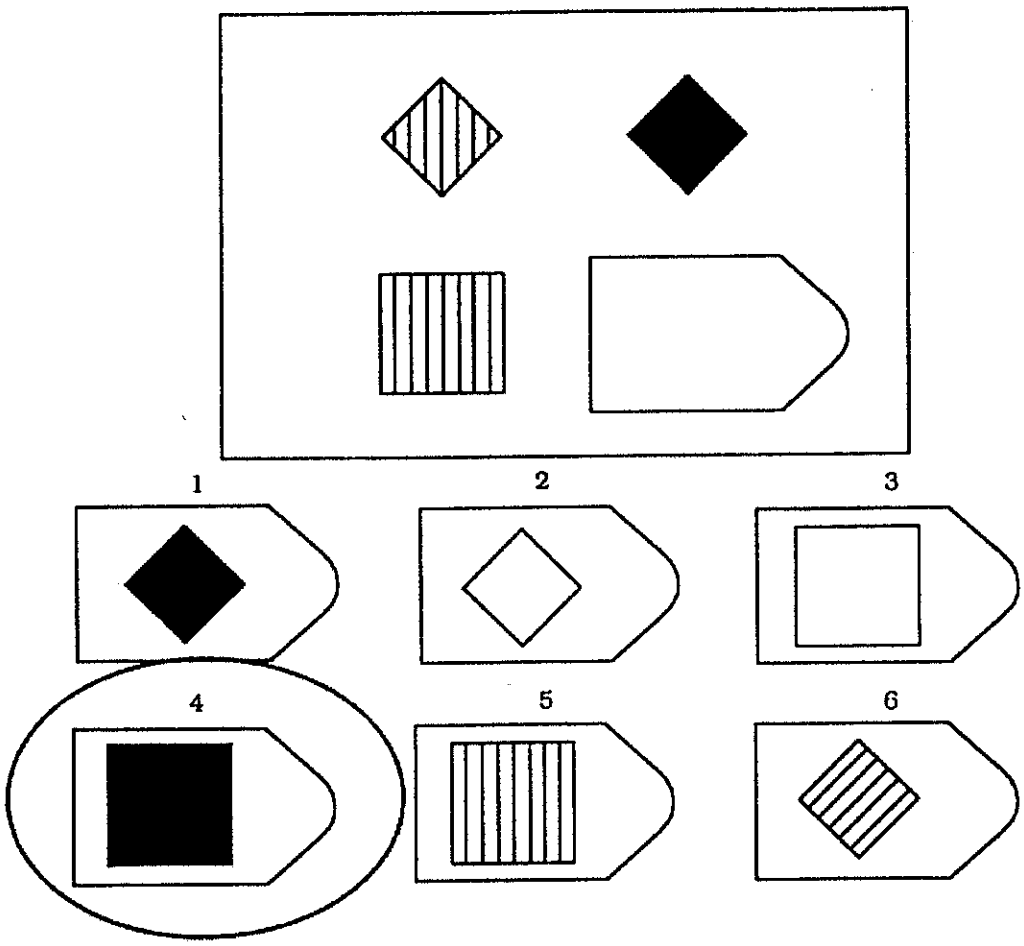
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

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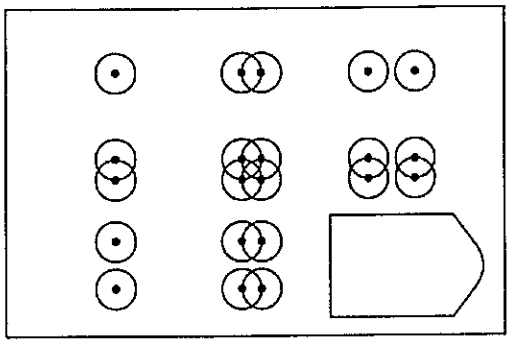

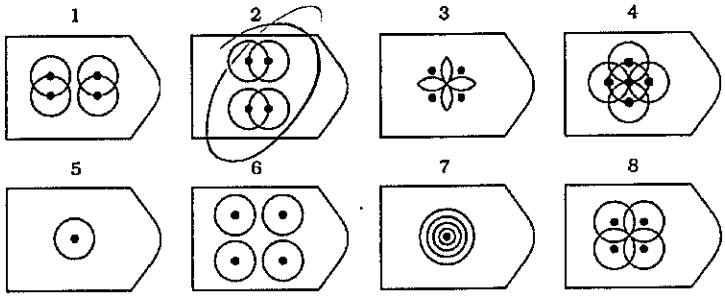

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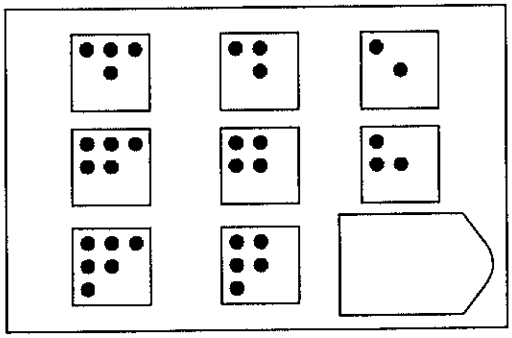

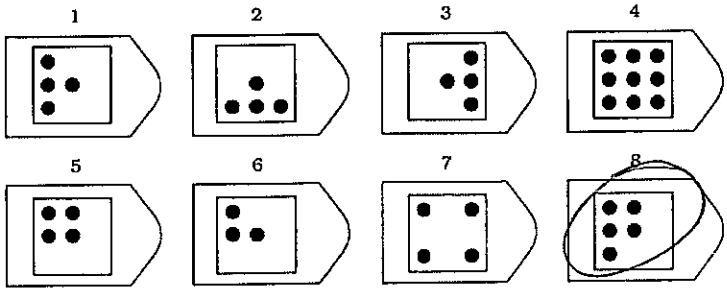

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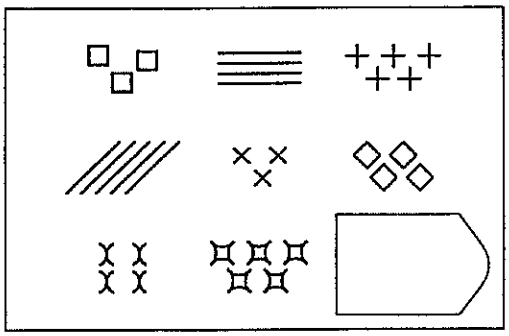
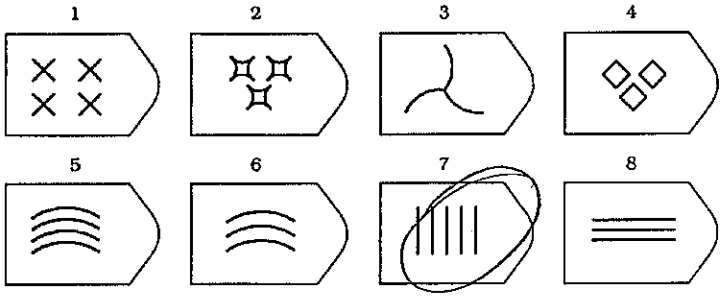
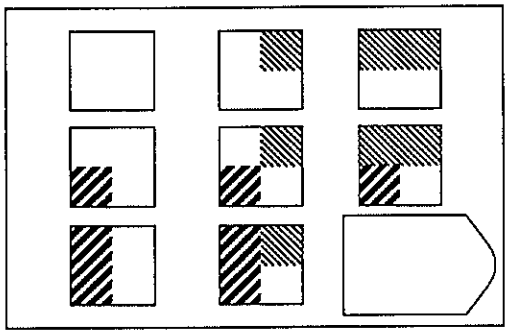
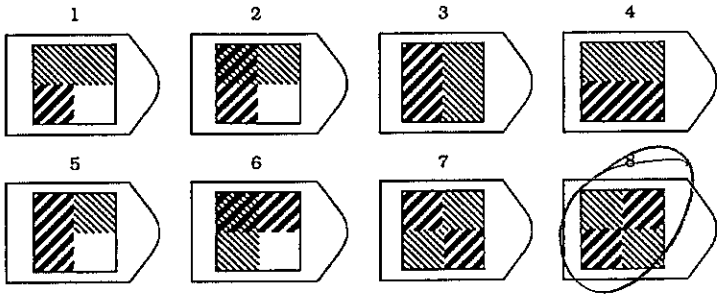
PATTERN 3





PATTERN 4





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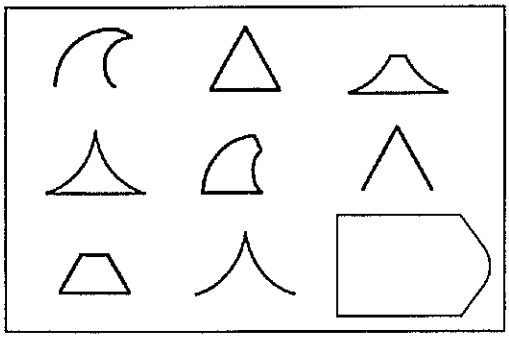

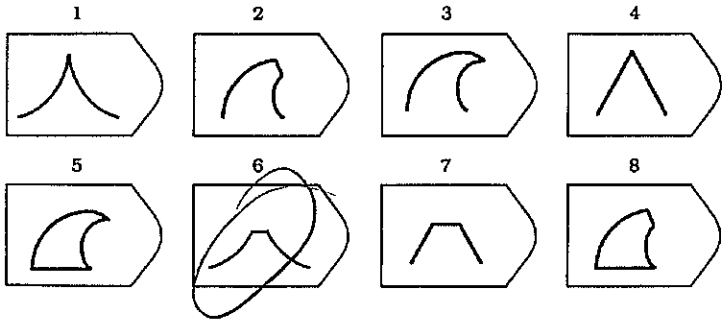

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Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

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C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

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C. Once he saw everyone else's formal suits, Dan went home to change clothes.

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C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 22 **years**

What is your home zip code? 48393

What is your gender?

✓ Male
___ Female
___ Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___ African American/Black
✓ Caucasian
___ Latino/Hispanic
___ Native Hawaiian/Pacific Islander
___ Native American
___ Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A 41823312 **GROUP:** 23
Version B

48

MULTIPLE-CHOICE. 5 points each (50 points total).

C 1. Which of the following would be considered a negative feedback to increasing global temperature?
a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
b. Melting of permafrost resulting in more methane escaping into the atmosphere
c. An increase in evaporation and cloud formation resulting in the release of latent heat
d. An increase in desert formation resulting in more dusting blowing into the atmosphere

D 2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
a. The magma becoming colder
b. Gas bubbles forming in the magma
c. The surrounding crust becoming hotter
d. Crystals forming in the magma

C 3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

a. A= erosion, B= deposition, C= uplift and erosion
b. A = erosion, B= biochemical precipitation, C= uplift and deposition
c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
d. A = dissolution, B= deposition, C= uplift and deposition

A 4. Which of the following statements about the greenhouse effect on Earth is most accurate?
a. Human activities are the primary cause of the greenhouse effect.
b. Natural processes are the primary cause of the greenhouse effect.
c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
d. Neither human activities nor natural processes are important causes of the greenhouse effect.
e. The human and natural causes of the greenhouse effect are not understood.

B 5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
a. Reservoir A has a shorter residence time than Reservoir B.
b. Reservoir B has a shorter residence time than Reservoir A.
c. Reservoir A and Reservoir B have equal residence times.
d. More information about Reservoir A and Reservoir B is needed.

4/1 2/1

C 6. Which of the following would cause the acidity of Earth's oceans to decrease?
a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

B 7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

$\frac{1000}{100} = 10$

$\frac{1000}{50} = 20$

a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

A 8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

A 9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

C 10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_20 \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

An increase in atmospheric carbon dioxide would effect the ocean by more CO_2 entering the ocean. $CO_2 + H_2O \rightarrow HCO_3 + H^+$ refers to this because with more carbon dioxide in the air (more heat would? be in the air as well causing increased evaporation) also more CO_2 would enter into the water increasing its residence time. Ocean acidification is the decrease of pH levels because of an increase in carbon dioxide. A positive feedback loop would be that the increased carbon dioxide in the atmosphere would increase CO_2 in the ocean & increase temperatures of both. A negative feedback would be more clouds forming in the atmosphere due to increased evaporation & possible increase of hurricanes, & other precipitation events which increase pH levels in the ocean.

?

8

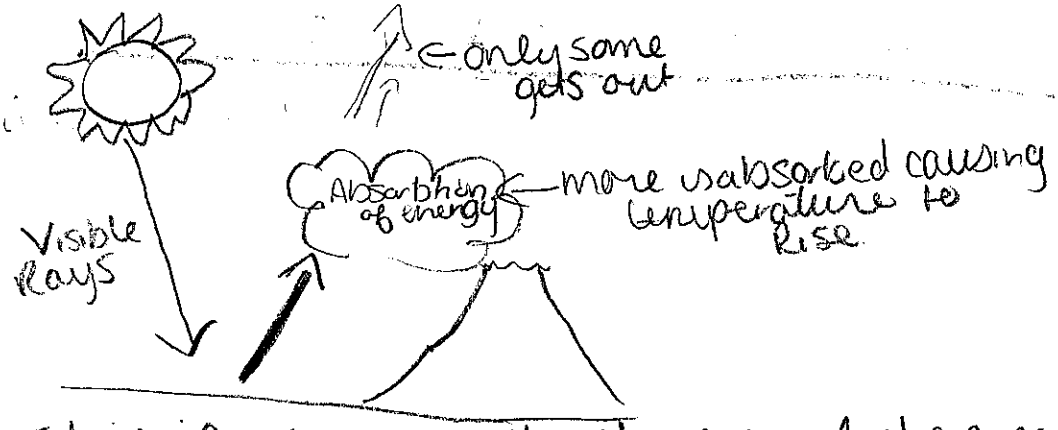
20

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature?

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

The increased ash clouds into the atmosphere would contribute to more CO_2 release into the atmosphere as well. With more carbon dioxide into the air, solar energy would have a higher residence time in the atmosphere, making temperature rise.



-This is almost exactly the case of the greenhouse effect but at higher levels. The greenhouse effect heats the earth due to increased carbon dioxide absorbtion of energy, rather than lesser levels of carbon dioxide being released back into space. With the large ash clouds, carbon dioxide would be more prevalent in the air, and with absorbtion of energy comes more heat.

8

Extra credit (2 points).
How are evaporation and degassing similar and/or different?
Evaporation is the release of water molecules in a gaseous state into the atmosphere, while degassing releases other substances into the atmosphere because of increased temperature

Earn up to 1 additional point on your course grade

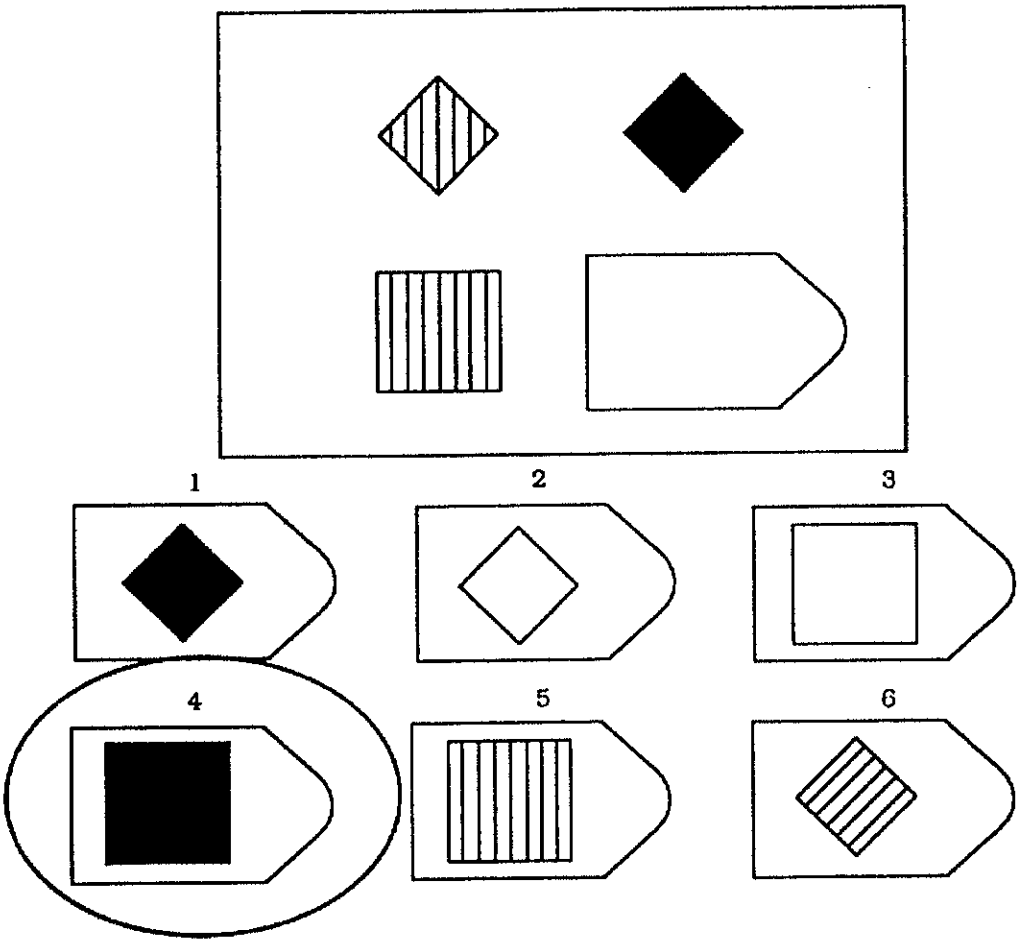
[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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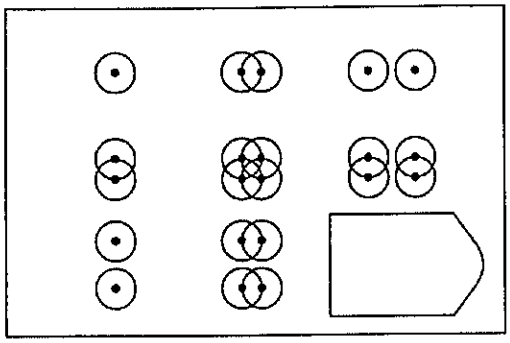
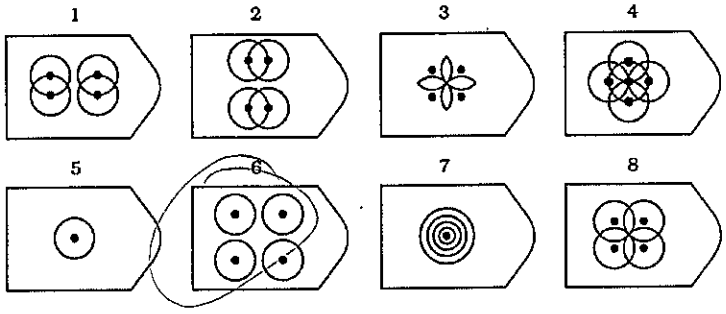
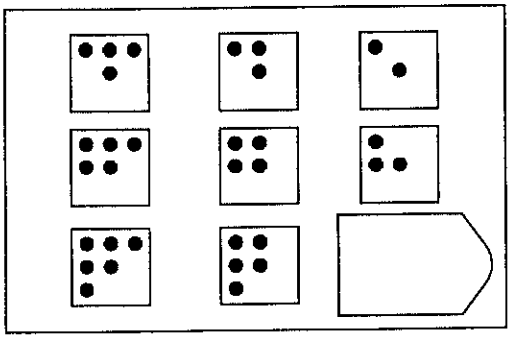
Please choose the image that best completes each of the following patterns.

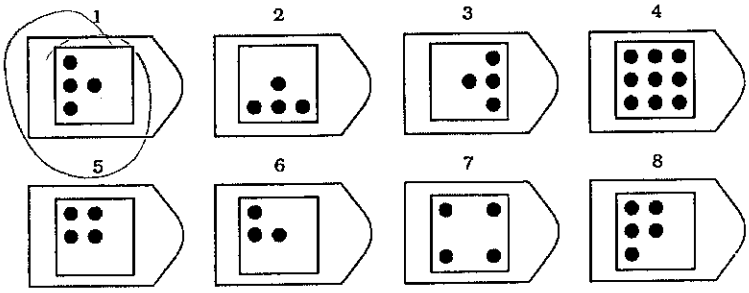
PATTERN 1





PATTERN 2





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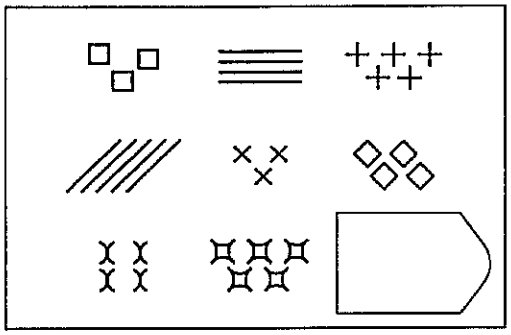
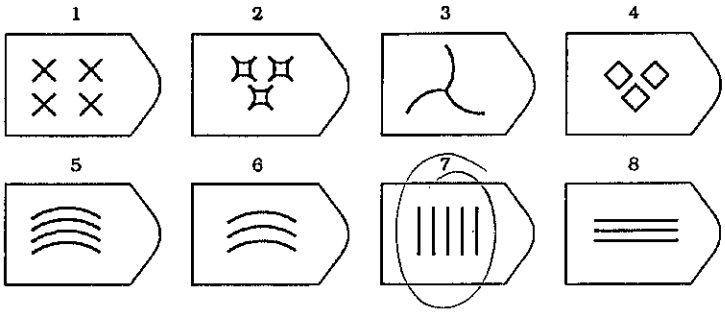
PATTERN 3





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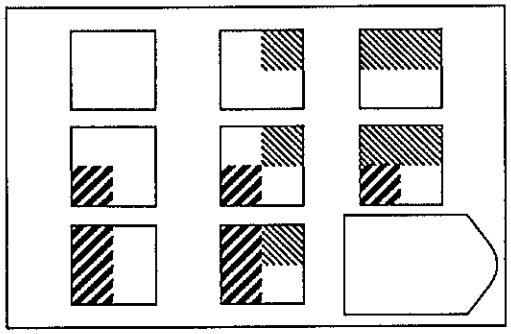

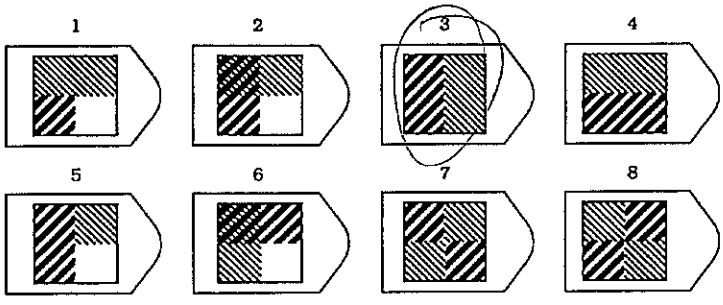

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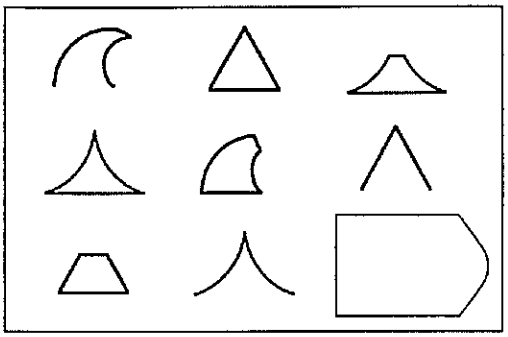
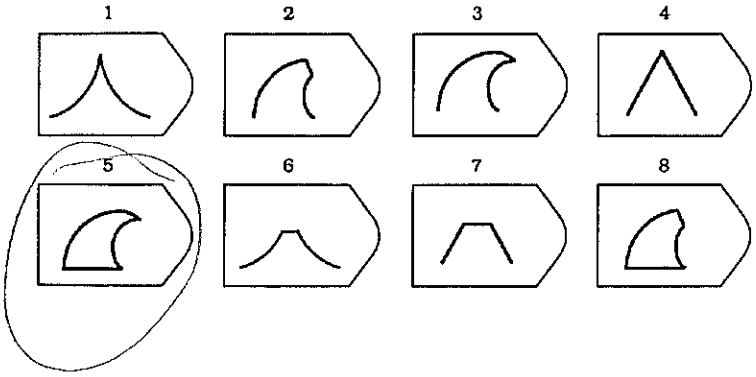
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

PLEASE CONTINUE ON NEXT PAGE

Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

PLEASE CONTINUE ON NEXT PAGE

5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 19 **years**

What is your home zip code? _____

What is your gender?

___Male
✓ Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
✓ Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A40208496 **GROUP:** 24
Version B

84

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   b. Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   c. The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   d. A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   c. Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   b. Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

   A B.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   b. A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?

a. The reservoir will eventually disappear.
b. The reservoir is not in equilibrium.
c. The reservoir is growing smaller.
d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?

a. The Earth's atmosphere would become colder than it is today.
b. The Earth's atmosphere would become warmer than it is today.
c. The Earth's atmosphere would remain about the same temperature as it is today.
d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?

a. Reflection of more solar radiation, causing atmospheric temperature to decrease
b. Reflection of more solar radiation, causing atmospheric temperature to increase
c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?

a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.

Cold water warm waters.

A40208496

SHORT ANSWER. 25 points each (50 points total)

1. How would an increase in atmospheric carbon dioxide affect ocean acidification?

Your answer should include:

a. An explanation of the process of ocean acidification. You may draw a diagram, explain the process in words, or both. This equation may be helpful: $CO_2 + H_2O \leftrightarrow HCO_3^- + H^+$

b. Discussion of both negative and positive feedback loops to the process of ocean acidification.

24

Ia increase in atmospheric carbon dioxide will increase the oceanic acidification. The acidification of the oceans occurs when carbon dioxide (CO_2) adds up with water causing HCO_3 or acid. An increase in carbon dioxide in atmosphere will cause an increase of carbon dioxide in the ocean through ~~perforation~~. However it is important to notice the importance of the ~~water~~ oceanic water temperature. Carbon dioxide dissolves faster in the cold water faster, because the molecules ~~of~~ in the cold water do not vibrate as fast as the molecules in warm water. Because the vibration pushes out the carbon dioxide and not letting it to dissolve. If the carbon dioxide increases in the atmosphere it will cause the Earth's temperature to rise, as well as the oceanic water temperature to rise. Therefore not allowing as much carbon dioxide to dissolve in the warm oceanic water & push the CO_2 back into atmosphere to keep the equilibrium. If not considering the water temperature, then the acidification would increase.

The positive feedback loop in the process of oceanic acidification is caused by the process moving in the same direction & creating more change. More CO_2 in atmosphere, → causes more CO_2 enter ocean → causes more interaction b/ H_2O & CO_2 → causes more acidification. → causes more disequilibrium b/ the systems → causes more threat to marine life. All changes are moving towards the same direction → bad direction.

The negative feedback loop – would be the idea of trying to balance the systems when two processes are going in opposite direction. The idea of increase in temperature & the movement of

•volcano - CO_2
•greenhouse effect
block of visible solar light
Bbais

2. Imagine volcanism on Earth suddenly increases dramatically, particularly volcanoes that erupt large ash clouds. How would this increase in volcanism affect Earth's atmospheric temperature? it would block the light but increase CO_2 erruption.

Your answer should include:

a. An explanation of all processes related to volcanism that influence atmospheric temperature. This will include an explanation of the greenhouse effect.
b. Clear connections between events and changes in atmospheric temperature.

Lithosphere, where the volcanoes come from, are the biggest reservoir of carbon dioxide, because of the limestone. When volcano erupts it releases a big amount of carbon dioxide into the atmosphere. Carbon dioxide is one of the main greenhouse gases that trap the heat from escaping the earth & keeping life on earth. However with more CO_2 in the atmosphere less heat will be able to escape or re-emit into the space. With the natural process the greenhouse effect receives heat from the solar energy, visible wavelight from the sun. Some of the heat is absorbed by the earth's surface +? keeping necessary temperature on earth, & some energy is reflected by into the space. However, because of increase in volcanic erruptions on earth would increase O_2 in the atmosphere, the atmospheric temperature would increase. However, the large ash clouds will play the role of blockers. The ash will create clouds in the atmosphere blocking the solar light, and reflecting it to the space. Which may slowdown the greenhouse effect. In one of the lecture readings I have read that scientists want to use the volcanic ash clouds to slow down the greenhouse effect & the process of sunlight entering the earth's surface. However the ash clouds do not stay in the atmosphere forever. After a while they dissolve.

23

The question you asked may have two answers if concerning all the possible processes. If talking just about large amount of ash clouds & greenhouse effect then the temperature would decrease, because the ash clouds will block solar radiation. But if talking about

2 Extra credit (2 points). How much CO_2 will be released because of volcanic erruption
How are evaporation and degassing similar and/or different? & ash clouds would dissolve →

Evaporation - is the process when liquid water becomes gas, in the atmosphere.
Degassing - is a similar process in the way is that it releases gas into atmosphere.
The difference is that evaporation has to do with water cycle, and degassing has to do

Essay question 1. A40208496

The negative feedback loop could be explained as followed: increase in carbon dioxide in atmosphere → increase in earths temperature → increase in ocean temperature → more molecule vibration → less carbon dioxide dissolution due to more molecule vibration; because more vibration kicks the CO_2 out into atmosphere → this negative feedback loop is trying to keep the equilibrium in the oceanic system.

Earn up to 1 additional point on your course grade

[ex. a 79% becomes an 80%]

Thoughtfully complete the attached survey

Essay Question 2; with time then the temperature would increase.

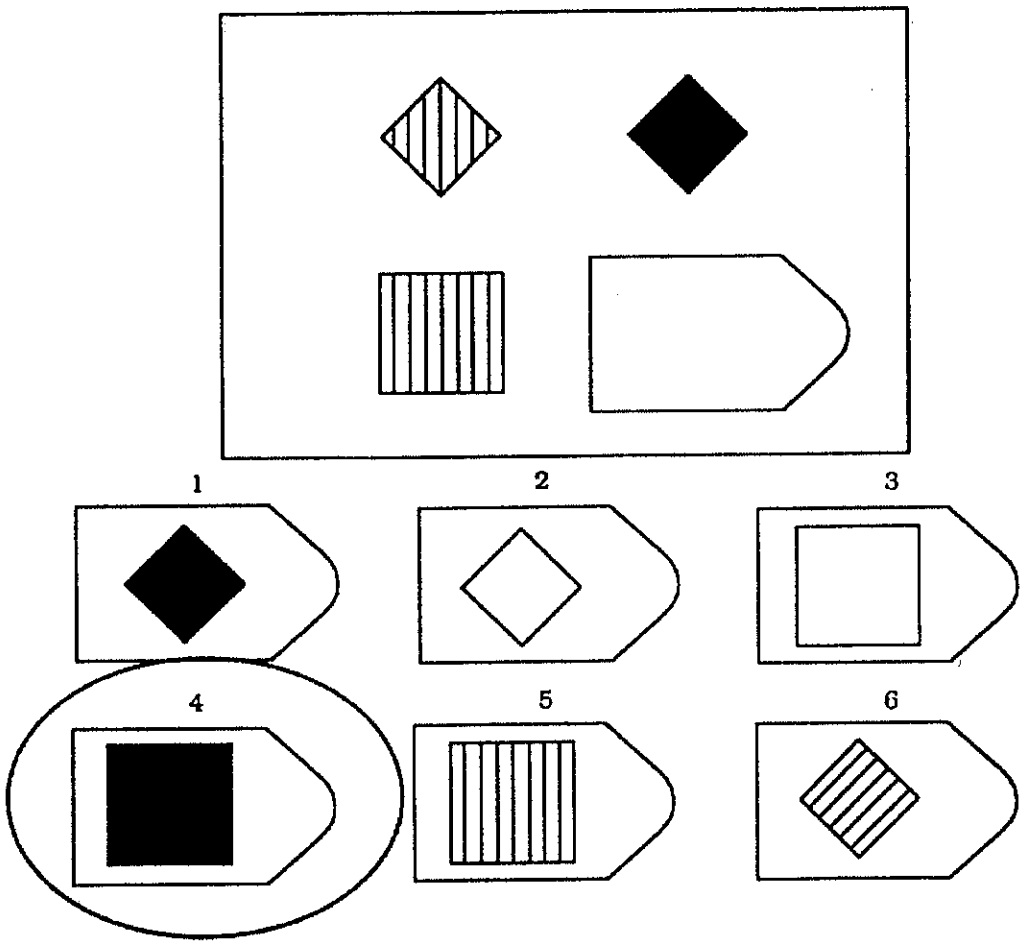
Ash clouds play a role of negative feedback loop in keeping the greenhouse affect to increase by blocking the solar radiation, therefore decreasing atmospheric temperature.
However, the positive feedback loop would be more volcanism, releasing more CO_2, increasing the temperature.

The processes of dissolving limestone due to change in pressure, temp, or composition, causing degassing of Carbon dioxide into atmosphere.

Analogical Assessment

In this exercise, you will be asked to solve a set of visual problems. In each problem, you will see a set of images that form a pattern. However, one image will be missing. You must choose the image that best completes the pattern.

Example



Answer: 4

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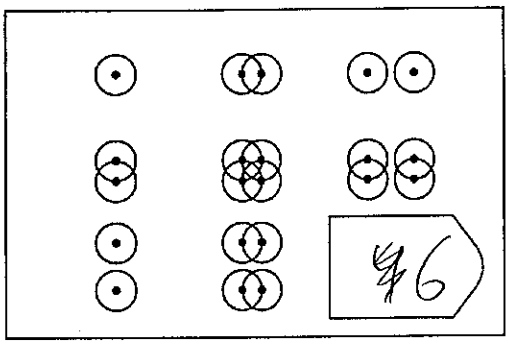
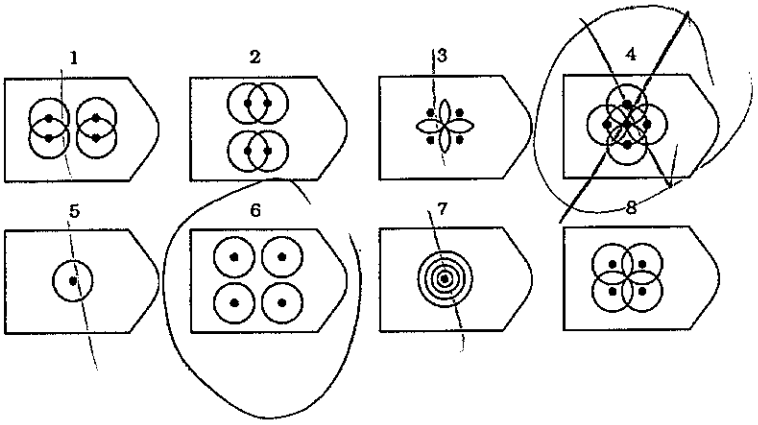
A4020496

Form B Test 1 Student ID _____

Please choose the image that best completes each of the following patterns.

PATTERN 1





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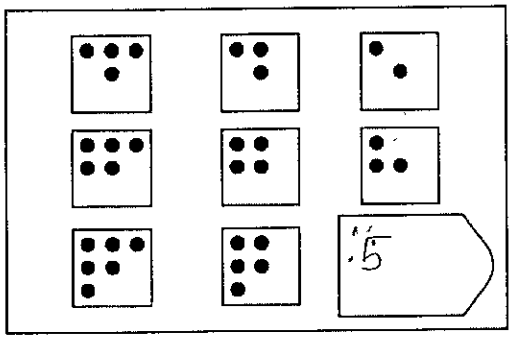

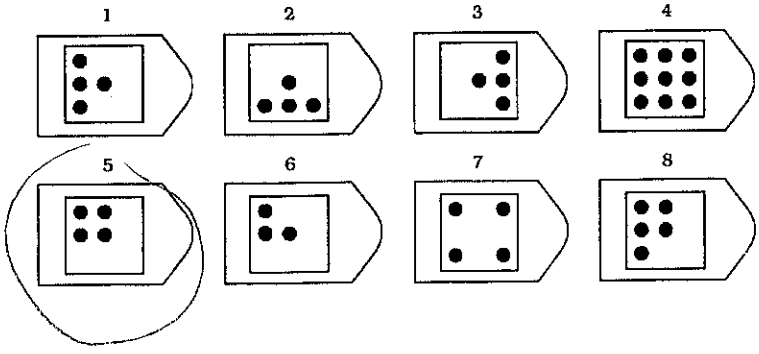

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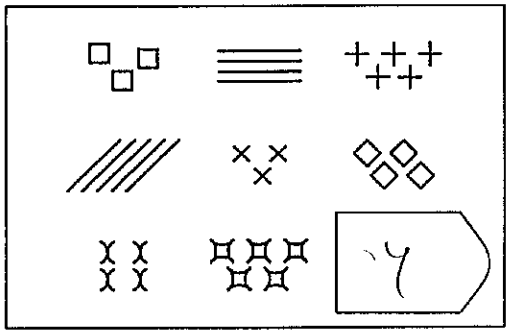
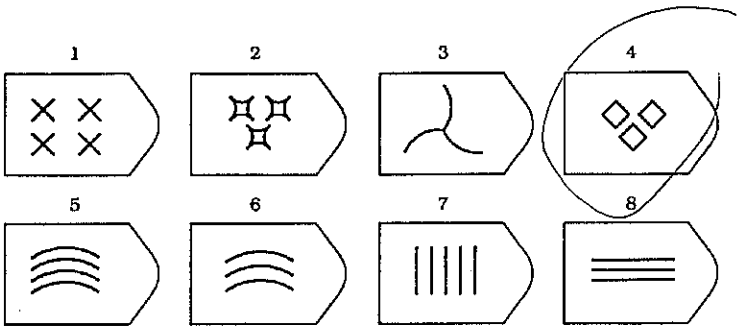
PATTERN 3





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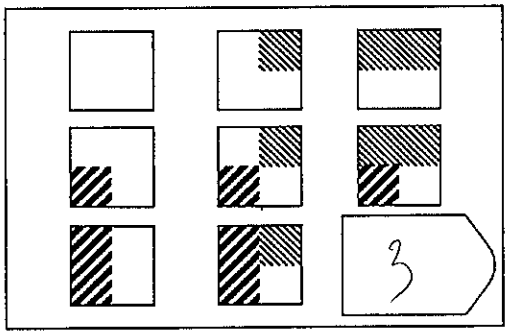

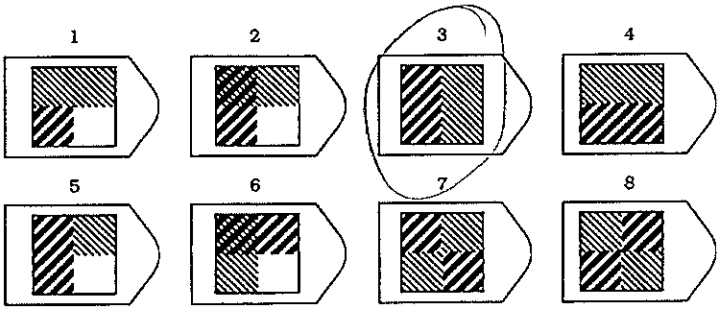

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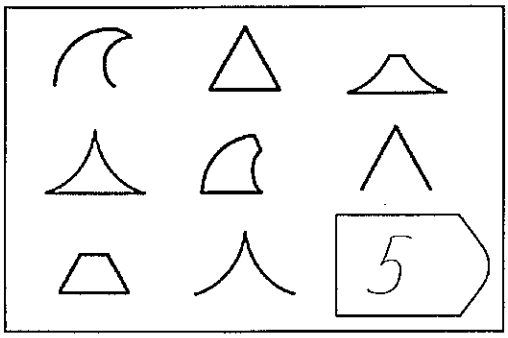
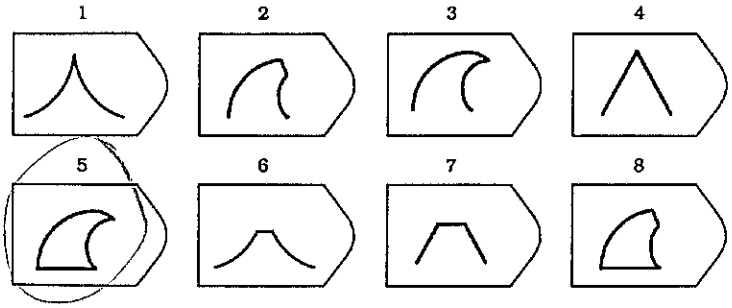
PATTERN 5





In this next exercise you will be presented with a base statement and three answer statements. The object of this exercise is to match the base statement with an answer statement that is the best analogy to the base.

Example

Base: Several pit stops during the race gave the car a chance to refuel and receive minor adjustments.

A. While migrating south for the winter months, the flock of geese would frequently stop near bodies of water for rest and rehydration.
B. Once the couple had had finished putting together their new entertainment center, the rest of the afternoon was spent rearranging furniture to accommodate it.
C. The car manufacturer decided to discontinue the model after research showed the faulty mechanism could have serious consequences.

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Please choose the best analogy to each of the following statements.

1. While testing a computer security system, the computer scientist accidentally released a destructive virus onto the internet.

A. While debugging their broken firewall, a programmer came across top-secret CIA files.

B. As the zoo keeper entered the habitat for cleaning, a wild tiger was able to escape into a local neighborhood.

C. After realizing that many of their vehicles had been manufactured with faulty brakes, an automobile company issued a nationwide recall.

D. When he realized that the public statement he had made might have been misleading, the politician went to great lengths to publicly correct any misconceptions.

2. In response to an embarrassing defeat, the volleyball coach scheduled several additional practices for the following week

A. Alan did badly on the first exam for one of his classes, so he decided to put in several extra hours of study.

B. Dan noticed a short break in the rainstorm, and made a dash from his building to the train station.

C. Jim's band has their first big gig next week, so they rehearsed for 10 hours straight on Saturday.

D. Some members of the basketball team suffered injuries on a ski trip, so they are spending many hours with the team physical therapist.

3. The couple saved for a fancy anniversary dinner by eating cheaply for the week beforehand.

A. Joe had easier access to his recipes by consolidating his most frequently used recipes into a single binder.

B. Bob was able to maximize his work time by cutting back on watching TV during the day.

C. Sean has been closely monitoring his eating in an attempt to improve his diet.

D. Mary opted not to take a "sick day" so that she would be able to have a longer Christmas vacation.

4. When she saw the menacing clouds, Margaret returned to her apartment to get an umbrella.

A. After eating a big lunch, Dan went back to his office and took a nap.

B. When the debate went badly, Ann decided to put more time into developing convincing arguments.

C. Once he saw everyone else's formal suits, Dan went home to change clothes.

D. When she heard the forecast, Jen became concerned about her plans for the weekend.

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5. Due to an especially high drop rate that quarter, the administration decided to combine students from two introductory psychology courses into a single class.

A. Because of low traffic volume, some of the underused outbound lanes of traffic are closed down in the morning.

B. Because the course content for 'Literature of Eastern Europe' and 'Russian Literature" was highly similar, the administration decided to combine the courses and create a Slavic literature course.

C. Because so many members of the Des Plaines Teamsters had left the union, their local branch disbanded.

D. On the basis of new information, the police officer revisited the crime scene to look for new evidence.

Please choose the response that is closest to an analogy that you might make.

1. Getting drunk is like…

A. Getting high. They are both involve too much of a chemical influencing the body.

B. Hitting your head. They both involve something that causes headaches.

C. Being sleep deprived. They both involve impaired functions.

D. Eating too much candy. They both involve lack of self-control.

E. Sleeping late. They are both caused by lack of self-control.

2. Water freezing is like…

A. Dew forming. They are similar because they both involve a drop in temperature.

B. Blowing up a balloon. They are similar because they both involve becoming less dense.

C. Clouds forming. They are similar because they both involve a phase change.

D. Building a house. They are similar because they both involve building a structure.

DEMOGRAPHICS

What is your age? 22 **years**

What is your home zip code? 48823

What is your gender?

___Male
✓ Female
___Transgender

What is your ethnicity? CHOOSE ALL THAT APPLY.

___African American/Black
✓ Caucasian
___Latino/Hispanic
___Native Hawaiian/Pacific Islander
___Native American
___Other

ISP 203A: GLOBAL CHANGE
FINAL EXAM; Sibley/Libarkin, Spring 2011; **100 points**

STUDENT NAME: A43091747 **GROUP:** 24
Version B

17

MULTIPLE-CHOICE. 5 points each (50 points total).

1. Which of the following would be considered a negative feedback to increasing global temperature?
   a. Melting of ice sheets resulting in more visible energy from the Sun being absorbed
   (b) Melting of permafrost resulting in more methane escaping into the atmosphere
   c. An increase in evaporation and cloud formation resulting in the release of latent heat
   d. An increase in desert formation resulting in more dusting blowing into the atmosphere

2. Which of the following changes would cause a rising magma to increase the rate at which it rises toward the surface?
   a. The magma becoming colder
   b. Gas bubbles forming in the magma
   (c) The surrounding crust becoming hotter
   d. Crystals forming in the magma

3. Fill in the blanks. Calcium atoms in a limestone at Earth's surface become calcium atoms in solution through the process of ____A_____. Eventually, these same atoms reach the ocean where they become a part of crystalline limestone through the process of ____B_____ and compaction, and then limestone becomes exposed at Earth's surface through the processes of _____C_____.

   a. A= erosion, B= deposition, C= uplift and erosion
   b. A = erosion, B= biochemical precipitation, C= uplift and deposition
   c. A= dissolution, B= biochemical precipitation, C= uplift and erosion
   (d) A = dissolution, B= deposition, C= uplift and deposition

4. Which of the following statements about the greenhouse effect on Earth is most accurate?
   a. Human activities are the primary cause of the greenhouse effect.
   b. Natural processes are the primary cause of the greenhouse effect.
   (c) Human activities and natural processes are roughly equal causes of the greenhouse effect.
   d. Neither human activities nor natural processes are important causes of the greenhouse effect.
   e. The human and natural causes of the greenhouse effect are not understood.

5. Imagine two CO_2 reservoirs. Reservoir A is twice the size of Reservoir B. In both Reservoirs A and B, CO_2 influx and CO_2 outflow are equal. Which reservoir has the shorter residence time?
   a. Reservoir A has a shorter residence time than Reservoir B.
   (b) Reservoir B has a shorter residence time than Reservoir A.
   c. Reservoir A and Reservoir B have equal residence times.
   d. More information about Reservoir A and Reservoir B is needed.

6. Which of the following would cause the acidity of Earth's oceans to decrease?
   a. An increase in ocean temperature due to an increase in atmospheric carbon dioxide.
   (b) A decrease in ocean temperature due to blocking of solar radiation by volcanic ash.
   c. A decrease in ocean temperature due to a decrease in solar radiation emitted by the Sun.

7. A reservoir is 1000 km^3 in size, has an influx of 100 km/year and an outflow of 50 km/year. Which of the following statements is true?
   a. The reservoir will eventually disappear.
   b. The reservoir is not in equilibrium.
   c. The reservoir is growing smaller.
   d. The reservoir's residence time is 10 years.

8. What would happen to Earth's atmospheric temperature if the countries of the world limited human-caused greenhouse gas emissions to 1990 rates?
   a. The Earth's atmosphere would become colder than it is today.
   b. The Earth's atmosphere would become warmer than it is today.
   c. The Earth's atmosphere would remain about the same temperature as it is today.
   d. The role of positive and negative feedbacks makes it impossible to determine if Earth's atmospheric temperature would increase, decrease, or remain the same.

9. Imagine the Earth's atmospheric temperature is decreasing. This decrease in temperature will cause glaciers to form. What will be the effect of glacial formation?
   a. Reflection of more solar radiation, causing atmospheric temperature to decrease
   b. Reflection of more solar radiation, causing atmospheric temperature to increase
   c. Re-emitting of more infrared radiation, causing atmospheric temperature to increase
   d. Re-emitting of more infrared radiation, causing atmospheric temperature to decrease

10. Imagine that Earth's atmospheric temperature is increasing. This causes more evaporation and therefore the formation of more clouds. Which of the following statements is true?
   a. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a positive feedback to Earth's atmospheric temperature.
   b. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a positive feedback to Earth's atmospheric temperature.
   c. Less energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go down. This is a negative feedback to Earth's atmospheric temperature.
   d. More energy will be released during cloud formation, and therefore Earth's atmospheric temperature will go up. This is a negative feedback to Earth's atmospheric temperature.